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Journal of ARIZONA MEDICAL ASSOCIATION

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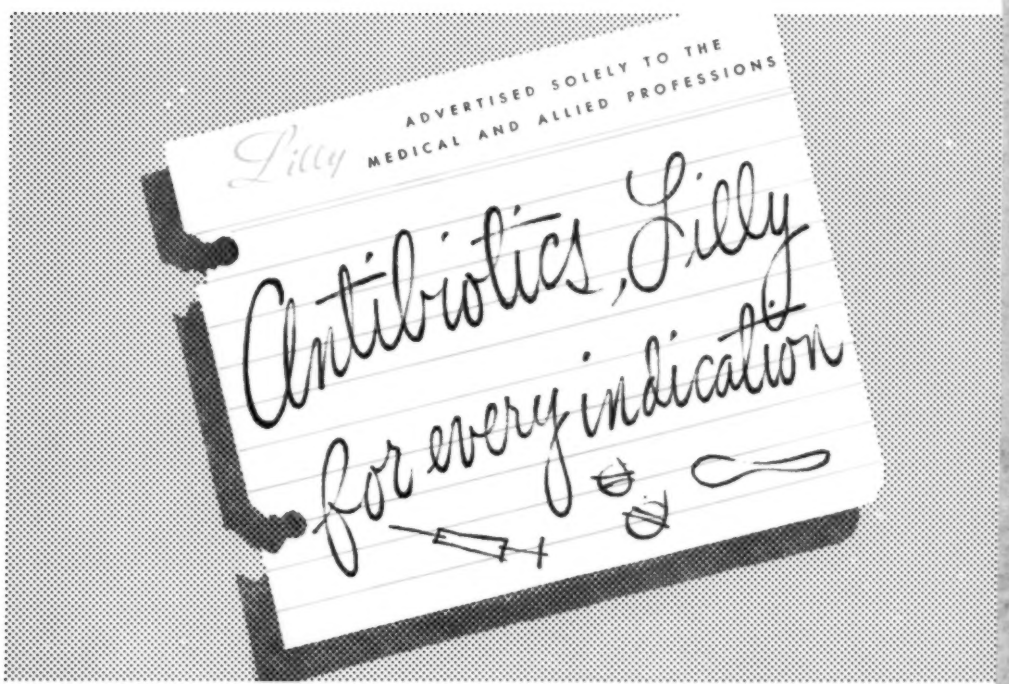
ANNUAL
APRIL 26, 27, 28, 29

MEETING
TUCSON, ARIZONA



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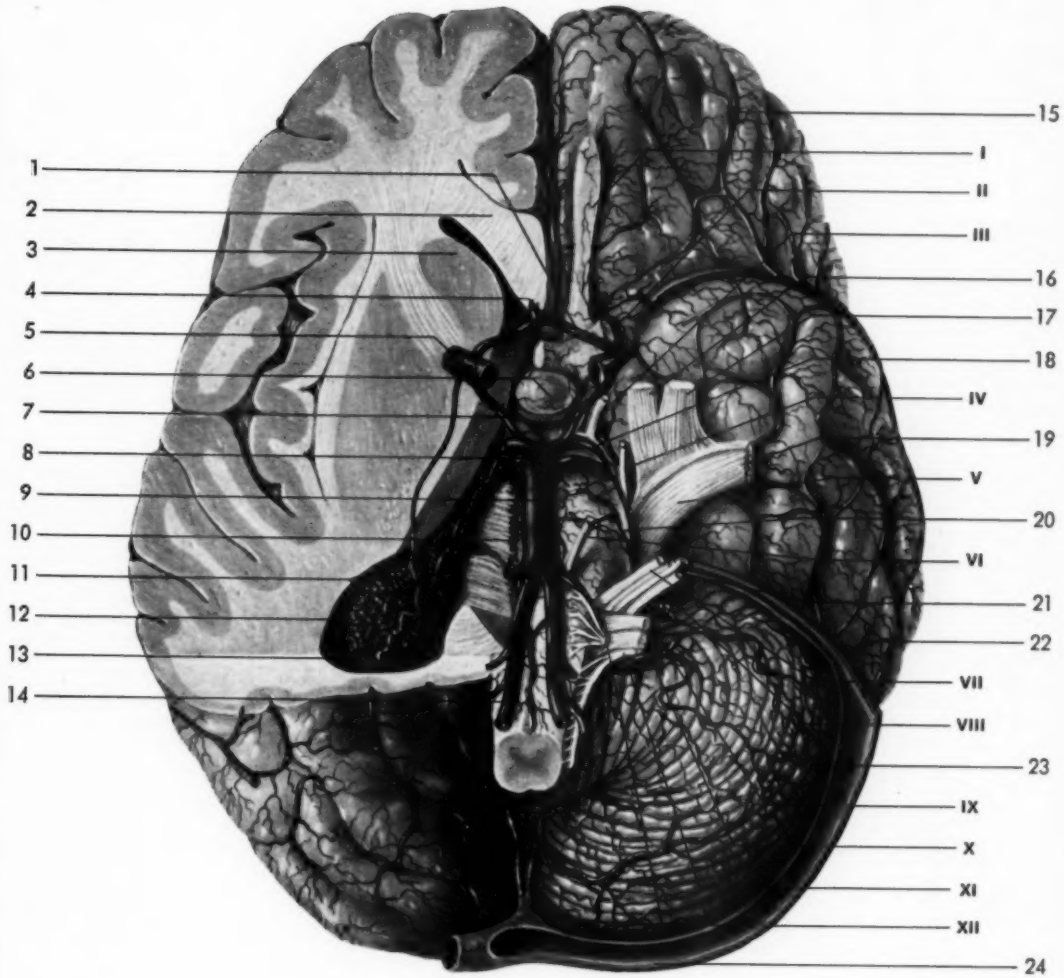
Anatomy *of the* Brain



1. Anterior cerebral artery
2. Trunk of corpus callosum
3. Head of caudate nucleus
4. Anterior communicating artery
5. Middle cerebral artery
6. Hypophysis
7. Posterior communicating artery
8. Superior cerebellar artery
9. Basilar artery
10. Internal cerebral vein
11. Choroid artery and vein
12. Choroid plexus of lateral ventricle
13. Inferior cornu of lateral ventricle
14. Vertebral artery
15. Frontal lobe
16. Ophthalmic nerve
17. Maxillary nerve
18. Posterior cerebral artery
19. Mandibular nerve
20. Pons
21. Intermediate nerve
22. Temporal lobe
23. Cerebellum
24. Left transverse sinus

CRANIAL NERVES

I. Olfactory nerve
II. Optic nerve
III. Oculomotor nerve
IV. Trochlear nerve
V. Trigeminal nerve
VI. Abducens nerve
VII. Facial nerve
VIII. Acoustic nerve
IX. Glossopharyngeal nerve
X. Vagus nerve
XI. Accessory nerve
XII. Hypoglossal nerve

This is one of a series of paintings by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

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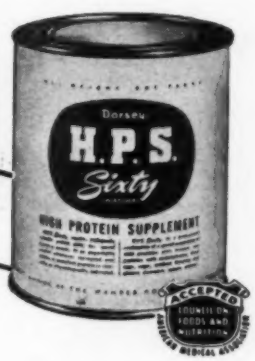

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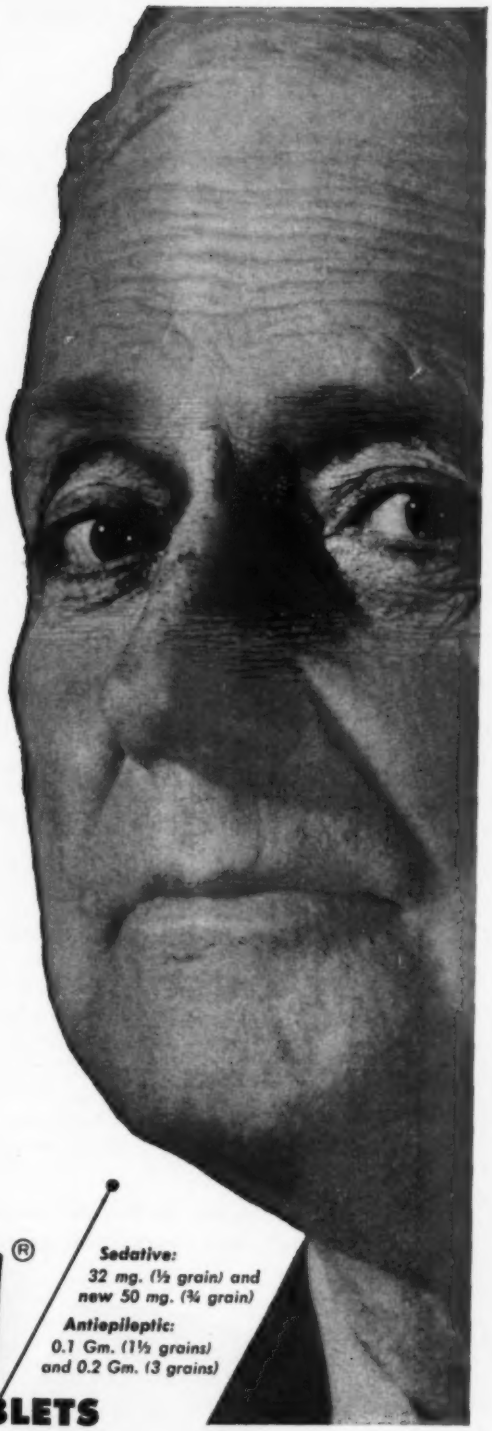

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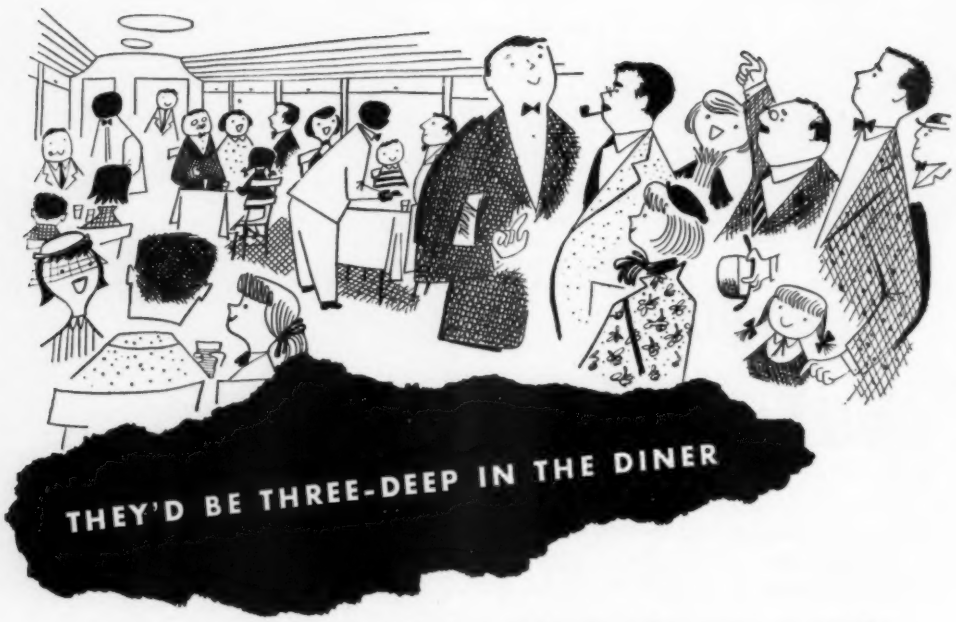

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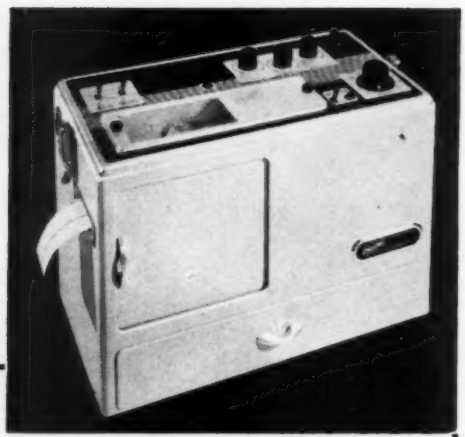

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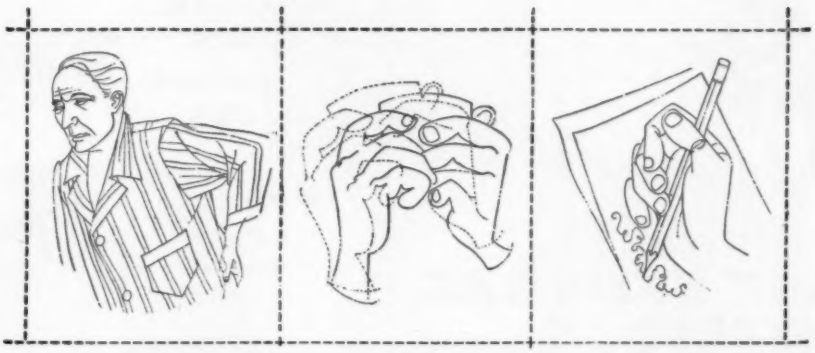

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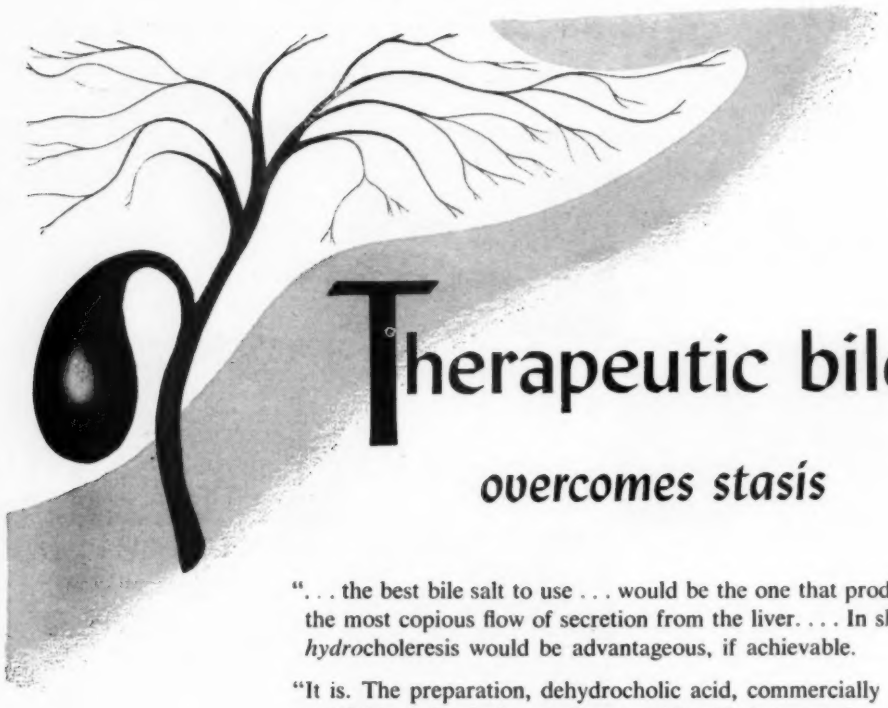

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*Beckman, H.: Pharmacology in Clinical Practice, Philadelphia, W. B. Saunders Company, 1952, p. 361.

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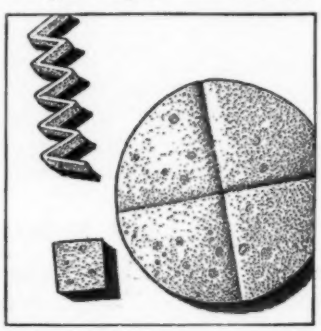

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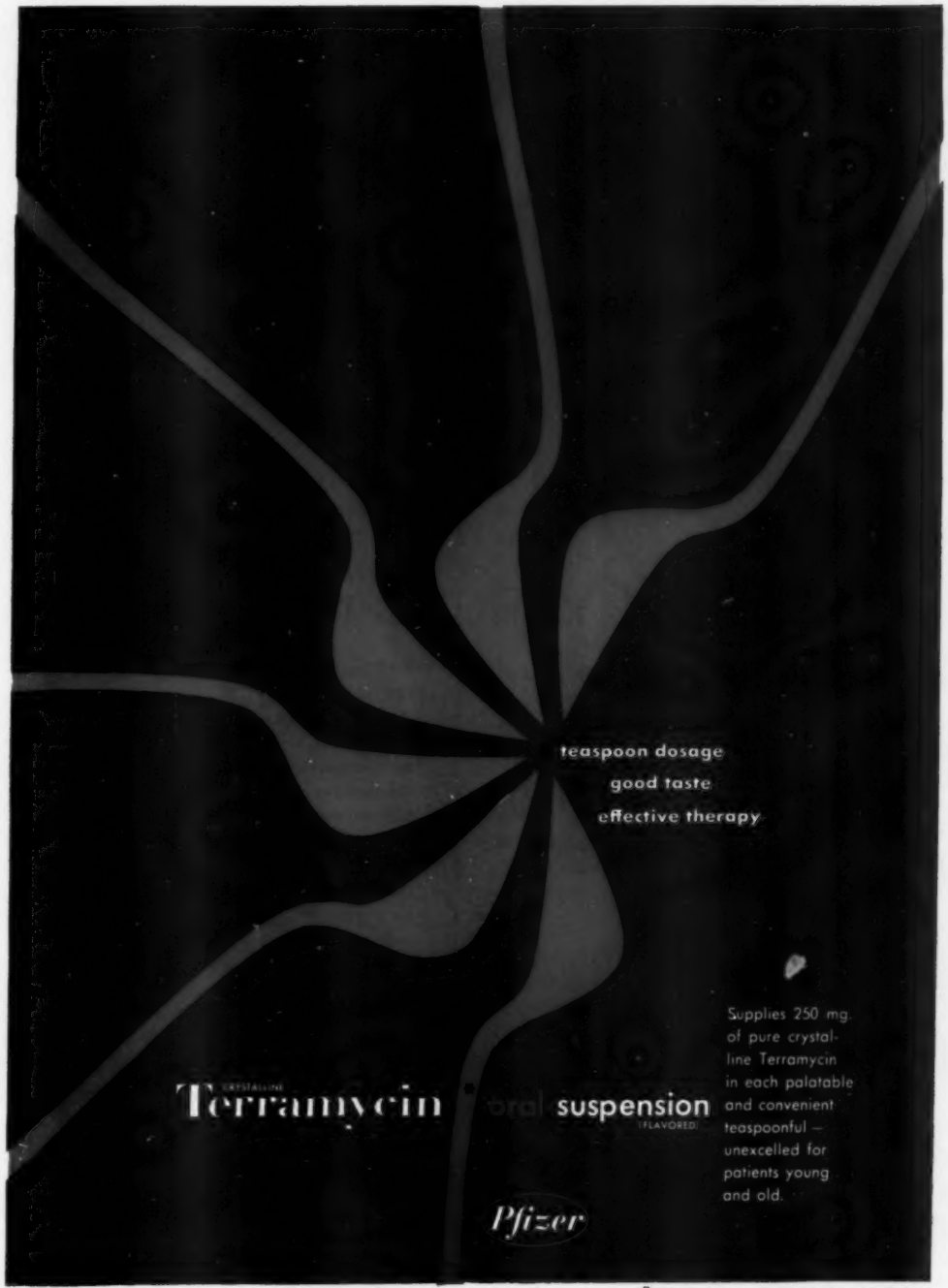

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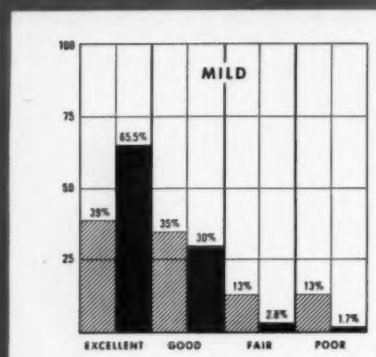

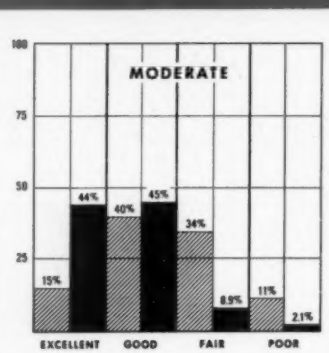

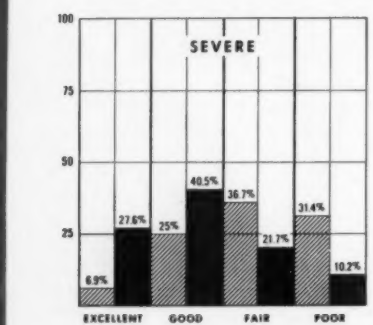

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Journal of Arizona Medical Association

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Original ARTICLES

STAB WOUND OF THE BLADDER COMPLICATED BY WOUNDS OF THE SMALL INTESTINE AND MESENTERY

Lazarus Manoil, M.D.
Phoenix, Arizona

INTRODUCTION:

Bladder wounds are encountered very infrequently in civil practice as shown by the records of our large hospitals. Even in war, the condition is met far less commonly than might be supposed. The anatomical location of the bladder, protected as it is by the bony pelvis, is such as to render it peculiarly immune to wounds and injury.

Bartels in 1878 found only two cases in a total of 16,711 surgical admissions to St. Bartholomews Hospital between 1869 - 1875. Stevens and Delzell reported in 1937 twenty-seven cases of bladder injury that had been seen in the Urological Department of the Bellevue Hospital during the previous twelve years. These constituted forty-five percent of all patients with bladder injuries who were admitted to all the services of the hospital during the period.

Stab wounds of the bladder can and do occur, especially when the bladder is distended. This is a report of such a case, complicated by multiple injuries to the small intestine and mesentery.

REPORT OF A CASE:

J. B., a 34 year old negro male, was admitted to the Emergency Surgical Service at Memorial Hospital on September 30, 1951 with evisceration of the small bowel. The complete history was unobtainable at the time, but essential facts of the case were that he was stabbed with a sharp knife in the lower abdomen about one hour before admission. He had been at a dance where he consumed large amounts of beer. He appeared to be in moderate shock. Physical examination disclosed a well-developed and well-nourished colored man with evisceration of the small bowel through an apparently small incision to the left of the suprapubic area. The intestines were matted with blood and dirt. Blood pressure on admission, 85/40; heart sounds, regular, of good quality, rate 92. The patient was given two units of plasma and oxygen to combat shock and Wangensteen Suction to empty the stomach while the operating room was being prepared. Surgery was started within one hour after admission. Proper preparation of the operative field was not satisfactory because of the eviscerated bowel. Examination of the extruded ileum disclosed the presence of nine small perforations of the lumen and two small perforations of the mesentery. These were closed with Lembert fine silk sutures. Examination of the laceration of the abdominal wall disclosed a tear three inches long through which the extruded bowel could not be replaced in the abdominal cavity. This laceration was extended upwards to enable adequate exploration of the lower abdominal contents and to permit return of the extruded bowel. Examination disclosed a small amount of fecal matter, clotted blood and some liquid with a smell suggesting urine. The descending colon and sigmoid appeared to be intact but examination of the bladder disclosed a tear in the dome about two inches long. The walls of the bladder were grasped with Allis forceps and the bladder

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cavity then cleaned out with aspiration and sponges. A small cyst was noted on the wall of the bladder close to the left ureteral opening which was not disturbed. A retention Pezzer catheter was then inserted into the bladder and the tear was then closed in two layers, chromic #0 for the mucosa and fine silk for the outer serosa layer. The prevesical space of Retzius was then cleaned and all bleeding controlled. A small Penrose drain was inserted in this area. A Penrose drain was also placed in the lower abdominal cavity and pelvis along with 10 grams of sulfathiazole crystals. The abdomen was then closed in layers, chromic #1 for the peritoneum, chromic #1 for the fascia and clips for the skin. The patient was given 1,000 cc. of blood during the operation which he stood very well and was returned to the ward in good condition. He was placed on penicillin and streptomycin, Wangensteen Suction for three days and the usual supportive treatment. Convalescence was uneventful. The drains were removed on the third postoperative day and the skin clips on the fourth day. The wound healed surprisingly well by primary union considering the lack of adequate preparation and its dirty condition at the onset. On the fourth postoperative day he had a voluntary bowel movement. He was transferred to the County Hospital on October 4, 1951, the fifth postoperative day, for further treatment. On October 10, 1951, the eleventh postoperative day, the suprapubic retention catheter was removed. The patient was able to void voluntarily the following day. Catheterization and irrigation of the bladder revealed no blood or large amounts of residual urine. He was discharged from the County Hospital on October 17, 1951, the eighteenth postoperative day and was last seen in my office on November 20, 1951 at which time he had no complaints referable to the gastro-intestinal or genito-urinary tracts. He was gaining in strength and planned to return to work the following week.

COMMENT:

The dangers from urinary extravasation and fecal contamination constitute the chief dangers of wounds of the bladder associated with injury to the intestines. The diagnosis of bladder injury is difficult but must be considered in all stab wounds of the lower abdomen with evisceration of the bowel. On exploration of the pelvis after replacement of the intestine, inspection of the bladder as well as other organs will reveal whether injury is present. Immediate surgery is therefore indicated to correct the defects and to clean the areas without further contamination. Suprapubic drainage of the bladder and drainage of the prevesical space of Retzius and contaminated abdominal cavity seem advisable to lower morbidity and mortality.

Fullerton(2) presented a study of fifty-three cases of bladder wounds which he saw at the Base Hospitals in World War I. Seventy percent of these were complicated by injury of the intestine or bone or both. In this group there were four cases of intraperitoneal wounds of the bladder and intestine. The main features of these cases reported were as follows:

(1) Resection of four feet of intestine with end to end anastomosis for multiple perforations (eleven) and two tears in the mesentery. A piece of shell in the bladder was removed and the bladder sutured. The abdomen was closed with a pelvic drain. A catheter was passed every four hours and the patient was passing urine normally in one week. The patient recovered.

(2) Bullet entrance wound right buttock. There were six perforations of the ileum closed by suture. Perforations of the bladder was closed with a double row of catgut sutures. The abdomen was closed. The prevesical space was explored and disclosed another small hole in the anterior wall of the bladder. This also was closed with a double row of catgut sutures. The space of Retzius was drained. The patient passed urine naturally without difficulty after the operation. There was some hematuria and pain two days postoperatively. X-ray showed a bullet in the bladder wall. This was removed by cystoscopy and forceps pushed through the wound of the anterior wall of the bladder. There was very little leakage from the wound. The patient was evacuated to England after two weeks of satisfactory convalescence.

(3) Laparotomy wound disclosed blood in the peritoneal cavity. One perforation of the ileum near the caecum closed with sutures and a group of perforations distant from the caecum resected. A missile was found in the perforated bladder and removed. The bladder was drained suprapubically, the rectovesical pouch also was drained. The patient was evacuated to England with a small drain in the bladder doing well.

(4) Bullet entrance wound at coccyx. A missile passed through the rectum and bladder and out through the suprapubic region. Suprapubic cystostomy and ileocolostomy were done at the clearing station. One month later, the patient was passing most of the urine per urethra. The wounds were almost healed in another month.

Sandrey and Mogg(3) reported in 1944 a series of five cases of wounds of the bladder seen at the Royal Naval Hospitals, only one of which, a rectovesical impalement, was not due to enemy action. They felt, 1) such wounds should be closed as soon as possible to avoid unnecessary high mortality and morbidity consequent to unsutured perforation of the gut; 2) suprapubic drainage plays an important part in the healing. The tied-in catheter never provides adequate drainage and its use is strongly deprecated; 3) Free drainage of prevesical cellular tissue adjacent to the perforation of the bladder is an essential part of treatment whether extravasation of urine has occurred or not.

Michels,(4) reporting for the surgical teams of which he was a member in Italian, French and German Theaters from January 1, 1944 to May 8, 1945, had one hundred fifty-five (4.9 per cent) bladder lesions among 3,154 wounded individuals having abdominal pathology. Of the one hundredy fifty-five cases, the correct diagnosis was made preoperatively or at surgery one hundred forty-nine times. Six cases were overlooked, two of these died the first postoperative day and the bladder wounds were found at autopsy. Three of the six developed urinary fistula (thigh, abdominal wound and to the rectum) and were later subjected to cystostomy with good results. The sixth passed a foreign body per urethra and recovered following insertion of an indwelling urethral catheter. One hundred thirty-four of the one hundred fifty-five cases (eighty-six percent) had bowel lesions in addition to the bladder damage. The mortality rate in cases having bladder lesions depends mainly on how much bowel damage co-exists. In the bladder injuries along with the small bowel (forty cases) the mortality rate was twenty-two per cent. Thirty-five cases were wounded with gunshot with a mortality of thiry-four percent. Seventy-one cases were wounded by shell fragment with a mortality of thirty-two percent. There were three cases of bladder injury classified as due to pressure with no deaths. In forty-six cases the agent causing injury was not recorded.

One hundred thirty-seven of the one hundred fifty-five cases had an intraperitoneal laceration of the bladder. Nine cases had only an extraperitoneal laceration and none of these died. Surgical procedures carried out for bladder wounds varied little. One hundred ten had a suprapubic cystostomy with a repair of the laceration. Thirteen cases had a suprapubic cystostomy without repair. Six cases had a repair without any other procedure. Three cases had an indwelling catheter. Six cases were overlooked and seven died on the operating table. Repair of the laceration with suprapubic cystostomy is the procedure of choice. The abdomen is opened to explore and repair whatever intraperitoneal injury is found and the intraperitoneal tear into the bladder is thus easily inspected and repaired at the same time. The space of Retzius is regularly drained. In this series sulfonamides were occasionally placed in the abdomen and in later cases penicillin was introduced intra-abdominally.

Summary

(1) A case of stab wound of the bladder associated with evisceration and multiple perforations of the intestines (nine) and mesentery (two) is reported.

(2) Brief review of the literature discloses the infrequency of such injuries in civil practice.

(3) Early surgical management with adequate drainage of the bladder suprapubically with a retention catheter is the preferable procedure. Drainage of the prevesical space of Retzius and pelvis is indicated because of gross contamination intra and extraperitoneally.

(4) Infection in the case reported was satisfactorily averted with adequate antibiotic therapy and supportive treatment.

REFERENCES

1. Graves, Roger Colgate; Injuries of the Bladder, Lewis' Practice of Surgery, Vol. 8, Ch. 13.
2. Young, Hugh H.; Wounds of Urogenital Trace in Modern Warfare, Jour. o fUrology, Jan.-June 1942, Vol. 47, pp. 59-108.
3. Sandrey, J. G., Capt. and Mogg, R. A. Lt. Comm.; Wounds of the Bladder, The Lancet, June 1944, pp. 716-720.
4. Michels, Leon M., Maj. M. C. AUS.; Wounds of the Urinary Bladder (An Analysis of 155 Cases), Annals of Surgery, June 1946, Vol. 123, pp. 999-1002.

MECKEL'S DIVERTICULUM

Jules L. Whitehill, M.D., F.A.C.S., F.I.C.S.
Tucson, Arizona

It is indeed fortunate that Meckel's Diverticulum is present in but two percent of all individuals. The potentiality of this vestigial organ for producing pathology is so enormous that were it unversally present, as is the appendix and gallbladder, it would rival those organs as a source of income for the surgeon. Because of its infrequency too little attention has been given to Meckel's Diverticulum as a source of possible abdominal symptomatology. It is unusual for the average surgeon in performing a laparotomy to look for a Meckel's Diverticulum even when the source of abdominal pain is unexplained. Too often the surgeon will take out a normal appendix and fail completely to explore the ileum. I myself have operated on several individuals with pathological Meckel's Diverticula who had previously been subjected to laparotomy for appendectomy. It is not fully realized by the rank and file of general surgeons that even the normal appearing Meckel's Diverticulum may be a source of abdominal discomfort. It has generally been assumed that, in the absence of infection, ulceration or other demonstrable pathology, Meckel's Diverticulum is a symptomless organ. Nothing could be further from the truth; as a matter of fact nothing could be further from the truth with regard to other diverticula of the small bowel such as those of the jejunum and duodenum. It is now recognized that all of these diverticula are potential producers of symptoms even in the absence of demonstrable pathology; and this is evidenced by the fact that upon their removal the patient becomes asymptomatic. It should be a routine in performing any laparotomy where the ileum is available for exploration and where the additional procedure is not a hazard to the patient, to explore the terminal three feet of ileum for a possible Meckel's Diverticulum.

Meckel's Diverticulum arises as a persistence of a vestigial structure present in the first few weeks of embryonic life, known as the vitelline or vitello-intestinal duct; so called because it is a tubular bowel-like structure extending from the primitive gut to the yolk sac. It apparently plays a role in the absorption of nutriment from the yolk sac before the placenta of the fetus is firmly implanted. This vitello-intestinal duct also masquerades under the alias of the omphalomesenteric duct because, when it persists in the fully developed individual, it may extend from the umbilicus to the terminal ileum. Most of the difficulties to which a Meckel's Diverticulum may give rise are related to its embryological development. (Fig. 1) For example, the entire duct may persist as a patent intestinal structure from the terminal ileum to the umbilicus resulting in an intestinal fistula opening through the umbilicus. This is a rather unusual occurrence. More frequently, the segment from the umbilicus to the persistent Meckel's Diverticulum may atrophy to form a solid cord. This then gives rise to a band stretching from the umbilicus to a Meckel's Diverticulum, or, if the entire process is reduced to a cord-like structure this cord may extend di-

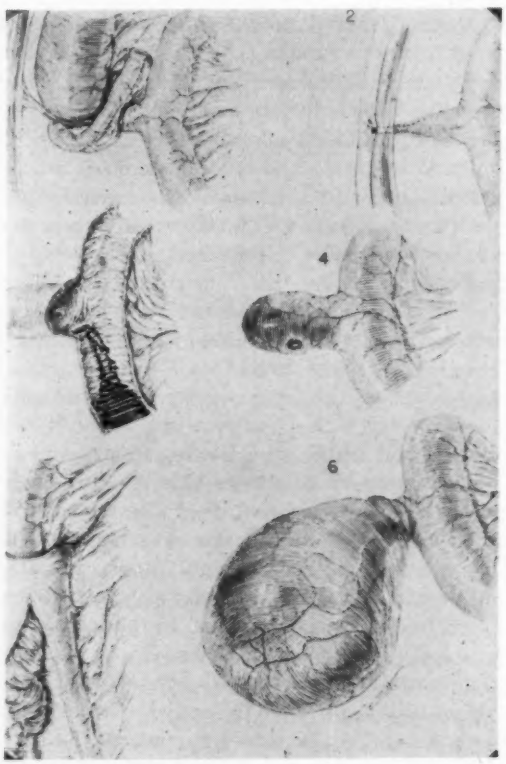


Fig. 1—Various complications of Meckel's Diverticulum based on anomalous development (1. Bowel obstruction; 2. Umbilical intestinal fistula; 3. Hemorrhage; 4. Perforation; 5. Intussusception; 6. Volvulus of Meckel's Diverticulum).

Read before the Annual Meeting of the Arizona Medical Association, Phoenix, Arizona, April 30, 1952.

rectly to the ileum and be the cause of intestinal obstruction by strangulation of adjacent small bowel. Most frequently, however, the connection between the umbilicus and the persistent diverticulum of the ileum disappears completely and what remains is the usual Meckel's Diverticulum; a tubular blind structure which extends for one inch to eight inches in length, and practically always arises from the antimesenteric border of the ileum. As previously noted, most of the Meckel's Diverticula arise within the last eighteen inches of ileum, but there are some which arise as high as two and a half or three feet above the iliocecal junction. On rare occasion it has been reported that the diverticulum may even be jejunal in origin. Not infrequently there are small subsidiary diverticula of the diverticulum which are of no special significance.

The most frequent symptom characteristic of Meckel's Diverticulum is the occurrence of gross bleeding. Such hemorrhage is much more frequent in the infant and first few years than it is in later life, although it may occur at any time from infancy to senility. The occurrence of such bleeding is the result of an embryological anomaly. Since Meckel's Diverticulum forms a part of the primitive gut, the multipotent cells within it are capable of producing most of the structures derived from the embryological gut. The most frequent ectopic tissue found in a Meckel's Diverticulum is gastric mucosa. This gastric mucosa is quite typical of the gastric mucosa found in the stomach and it is apparently capable of production of hydrochloric acid and pepsin. At least the chief and parietal cells of the gastric mucosa can be demonstrated in the gastric glands found in a Meckel's Diverticulum. Probably as a result of the presence of gastric mucosa, Meckel's Diverticulum may undergo peptic ulceration. Such peptic ulcers are usually present at the junction of the Meckel's Diverticulum with normal ileum. They give rise to bleeding which may be slow or profuse. Such blood when it traverses the colon may be evacuated as a tarry stool, or if the bleeding is very rapid it may be red to reddish black. It never is as bright as the bleeding which occurs from the terminal portion of the large bowel and this is often a clue to the site of bleeding. Any unexplained severe intestinal bleeding in an infant, or even in an adult, for which no other cause can be demonstrated, should be suspected of arising from a Meckel's Diverticulum. If a careful history is taken in the adult, it will often be found that prior to the onset of bleeding the patient complained of ulcer-like pain. Such pain frequently bears a relationship to meals but is not relieved by the ingestion of food or alkali. This too is often a clue to the presence of an ulcer of a Meckel's Diverticulum. Other types of ectopic tissue have been found in Meckel's Diverticulum the most frequent of which is pancreas. Colonic mucosa has also been found. Pos-

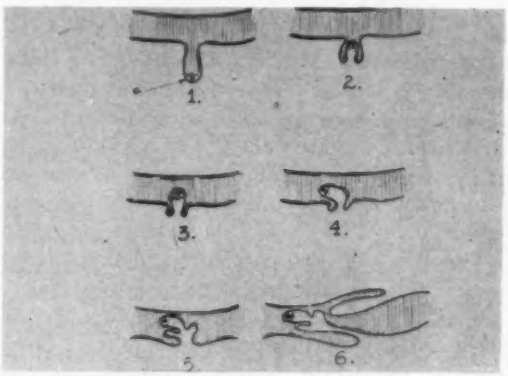


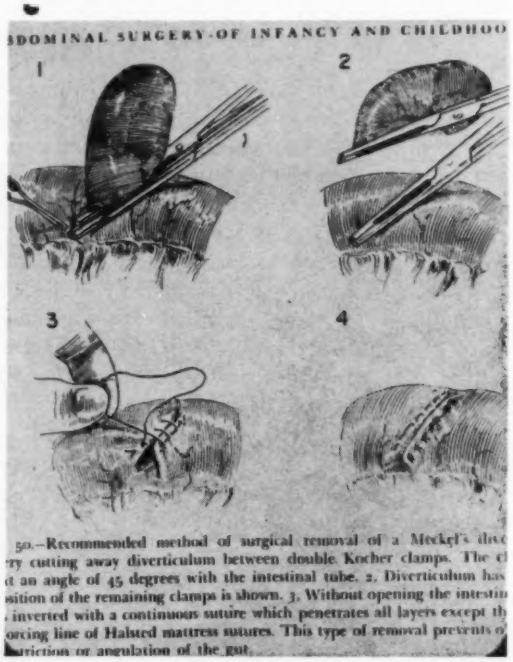
Fig. 2—Mechanism of Intussusception.

Fig. 3—Radiographic demonstration of Meckel's Diverticulum.

sibly because of the frequent presence of these abnormal tissues, tumors of Meckel's Diverticulum have been reported now and then. Carcinoma arising in a Meckel's Diverticulum has been reported. Carcinoid tumors occasionally occur and even sarcoma of a Meckel's Diverticulum has been reported. Ulceration of a Meckel's Diverticulum may go on to perforation with a generalized peritonitis. If a generalized purulent peritonitis is present upon laparotomy in a child with a normal appearing appendix, the ileum should be explored for the presence of a perforated Meckel's Diverticulum. Occasionally a Meckel's Diverticulum will have a very narrow communication with the ileum. In such a case the Meckel's Diverticulum may enlarge because of its inability to expel its contents and finally undergo pressure necrosis and gangerene. Or a Meckel's Diverticulum may twist at its base and produce strangulation of the organ. Several instances have been reported in which a very long Meckel's Diverticulum has tied itself into a knot, producing strangulation of included small bowel. In intussusception and particularly in recurrent intussusception, consideration must always be given to the possibility that the start of the lesion may be a Meckel's Diverticulum. Meckel's Diverticulum produces this condition by becoming inverted into the lumen of tthe ileum, thus serving as a bolus which the ileum tries to propel forward. In so doing, telescoping of the Meckel's and the ileum occurs into the more distal ileum. (Fig. 2) This is one of the more frequent complications of Meckel's Diverticulum. Finally a Meckel's Diverticulum may serve as a nidus for foreign bodies of one kind or another. Occasionally a concretion forms within the diverticulum which may be radioopaque. Unexplained round calcific shadows on x-ray should be suspected, in the absence of other demonstrable cause, of being enteroliths in a Meckel's Diverticulum. At times an injected foreign body will lodge within a Meckel's Diverticulum so that perforation by chicken bones and even vegetable shells has been reported.

The diagnosis of Meckel's Diverticulum is largely a clinical one and cannot be proven until surgical exploration. Only on rare occasions has it been possible to demonstrate a Meckel's Diverticulum radiographically, either by means of a G I series from above or on retrograde filling from a barium enema. (Fig. 3) The absence of such demonstration by x-ray in no way precludes the presence of a Meckel's Diverticulum. I should like to reiterate that, in the presence of unexplained abdominal pain peptic in nature or otherwise, the possibility of a Meckel's Diverticulum should be strongly considered. Further, I should like to reemphasize the necessity for exploration of the terminal several feet of ileum at every laparotomy, when such explorattion does not jeopardize the patient. The surgeon will be richly rewarded by finding a structure which is a very importatnt potential hazard to the patient if not the actual cause of the patients symptoms; and he will be saved from the embarrassment of its subsequent removal by another surgeon.

The technique of removal of a Meckel's Diverticulum is a relatively simple one. It has been recommended by some that a clamp be placed across the base of the Meckel's Diverticulum in a longitudinal direction and that it be sewn transversly. Others recommend a transverse application of the clamp, while still others have recommended that a purse string be placed about the base. The purpose of all of these maneuvers is to prevent encroachment upon the lumen of the bowel. Of course, the lumen of small bowel can be encroached upon to a rather marked degree withou producing obstruction inasmuch as the normal contents of the bowel



50.—Recommended method of surgical removal of a Meckel's div
ry cutting away diverticulum between double Kocher clamps. The cl
t an angle of 45 degrees with the intestinal tube. 2. Diverticulum has
sition of the remaining clamps is shown. 3. Without opening the intestin
inverted with a continuous suture which penetrates all layers except th
oxing line of Halsted mattress sutures. This type of removal prevents o
striction or angulation of the gut.

Fig. 4—Surgical technique for removal of Meckel's Diverticulum (Ladd and Gross).

are liquid. Ladd and Gross have recommended that an Ochsner clamp be used across the base of the diverticulum in an oblique direction to the long axis of the bowel. (Fig. 4) This is a compromise between the transverse and the longitududnal applications of the clamp and tends to prevent the narrowing of the bowel. The clamp should be placed well down at the base because, as previously mentioned, many of the ulcers are at the junction of the diverticulum with normal bowel. The diverticulum is excised above the clamp with a carbolized scalpel, a running atraumatic chromic suture of the Parker-Kerr type is applied, the clamp removed and the bowel edges inverted. The same suture can be run backward as a continuous Lembert suture and tied to itself. A third row of interrupted fine silk sutures completes the closure.

CONSERVATIVE SURGICAL PROCEDURES IN THE TREATMENT OF PULMONARY GRANULOMAS

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Granulomatous inflammation may be defined as an exudative and productive reaction in the tissues, characterized by the accumlation and proliferation in the injured area of reticuloendothelial cells. The exudative reaction in this definition refers to the presence of fluid elements derived from the circulation and the productive (or proliferative) component comprises the growth of new tissue or cells.

The proliferating cells found in such a process are reticuloendothelial cells, or as sometimes named, wandering cells, macrophages or histiocyttes. In the presence of some injurious agents these cells are involved not only in a proliferative process but in a necrotizing reaction as well. The deposition of granules within an area accompanying the proliferative response of cells has led to terming this inflammatory process a granuloma(1).

A large variety of etiological factors are responsible for the production of granulomas and among the known group are viral, bacterial, mycotic, chemical and physical agents. Other unknown agents are responsible for such diseases as nonspecific granulomatosis of the intestine and Boeck's Sarcoid.

Much has been written in reference to the diagnosis of these lesions and that phase of the subject will not be discussed in detail. Suffice it to say that the more important examinations relative to a diagonsis include serologic procedures, cutaneous tests, x-ray examinations including tomography, smears and cultures from specimens, sputums, and any draining exudates, and biopsy. The histopathological characteristics of biopsied lesions are readily recognized but they provide little help in determining the specific etiologic agent.

In situations presenting diffuse granulomatous involvement of both lungs or of the mediastinal lymph nodes a biopsy of the supraclavicular nodes overlying the scalene muscles in the anterior triangle of the neck will frequently aid in arriving at a diagnosis. The biopsy can be performed and may be revealing even though the nodes are not enlarged and palpable. With the good resultts obtained in the treatment of sarcoid with cortisone, biopsy of the lung should be seriously considered when Boeck's sarcoid is strongly suspected(2).

Although these disease entities are frequently widely disseminated throughout the entire body, further comment in their regard will be limited to their occurence within the lungs.

The granulomatous inflammatory diseases bear resemblances clinically, and grossly all granulomas present similar appearances. Because they are fundamentally alike anatomically, lesions of such nature situated in the lungs produce roentgenographic shadows of marked similarity, that may be cavitary or nodular in configuration.

Many of the granulomatous lesions of the lungs can be managed conservatively, e.g., coccidioidomycosis frequently appears as an isolated parenchymal infiltration with or without cavitation and fades away by spontaneous resolution or leaves behind a fibrotic or calcific scar. There are numerous available references to the spontaneous healing of histoplasmosis: deduced by finding healed nodular foci in lungs of individuals living in an endemic area, who present positive skin tests for that disease and negative tuberculin reactions.

However, for reasons to be elaborated upon,

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the granulomatous diseases of particular interest to the physician and surgeon are those in which a definite diagnosis cannot be readily made. Among these are cavitary lesions which strongly resemble pulmonary tuberculosis and solitary nodules in the periphery of the lung which roentgenographically are not unlike peripheral neoplasms. In the Southwestern states coccidioidomycosis assumes a particular role of interest for it is a great imitator of both tuberculosis and neoplasm.

Surgical extirpation should be considered for the granulomatous processes that manifest certain complications arising from the disease focus, and when a granuloma mimics a pulmonary neoplasm.

The most frequent complications inviting surgical intervention are hemoptysis, secondary infection of the cavities (with or without demonstrable bronchiectasis), and spontaneous rupture of a cavity with its inescapable sequelae. Other indications for surgery include indeterminate lesions failing to respond to medical treatment and residual cavities persisting due to epithelial linings.

An apical cavitary lesion that strongly simulates tuberculosis by x-ray or in which debatably pathogenic acid fast bacilli have been recovered from the sputum should also be presented for surgical consideration. Acid fast bacilli are sometimes recovered only on one occasion and may or may not be proved to be Myobacterium tuberculosis, nevertheless the patient may be catalogued as tuberculous and be treated accordingly with less efficient procedure than resection surgery.

Within the past few years all physicians have been made conscious of the solitary rounded density observed on x-ray examination of the chest and are confronted with the management of such a finding. Individuals harboring these abnormal densities are often symptomless and their number has increased with the popularity of mass x-ray surveys. A peripheral primary malignant neoplasm of the lung may arise insidously, without symptoms, and be depicted as a similar rounded mass on x-ray examination. Other lesions of the lung giving the appearance of a rounded density on x-ray are granulomas, hamartomas, solitary metastatic nodules, abscesses filled with fluid, bizarre cystic diseases such as echinococcosis, and benign neoplasms (including bronchial adenoma). These lesions may be indistinguishable roentgenographically and when a definite diagnosis cannot be made beforehand a neoplasm of the lung must be considered foremost and excisional surgery advised.

As described by the Mayo Group, who have reported their experience with sixty-five cases of a variety of surgically removed pulmonary granulomas, resection is the best treatment in many instances. However, it is not as urgent or as necessary as in the case of pulmonary neoplasms(3). In 1950 Melick published an enlightening review of expressed opinions on the surgical management of chronic forms of coccidioidomycosis. Practically all the surgeons responding to his inquiry were in favor of excisional surgery, of various types, when the indications recounted above were present(4). It behooves the clinician and the surgeon, therefore, to attempt to make the proper diagnosis in order that operation might be delayed or denied those individuals with benign granulomas. However, as inferred previously, the diagnosis frequently cannot be made until the time of thoracotomy.

The surgical principles applicable to the small lesion with cavitation and the solitary rounded foci of pulmonary tuberculosis are well suited for the surgical extirpation of other granulomas as well. These lesions frequently are confined to segments or subsegments or present on the surface or margin of a lobe. As Chamberlain has indicated, if there is a question of the presence of tuberculosis the size of the lesion has little to do with its activity or its potential danger and indeed the future course of caseous lesions is unpredictable(5, 6).

The requirements and objectives of the surgical technics that should be applied are the removal of the major localized disease foci and preservation of the maximum amount of normal functioning pulmonary tissue.

The stated requisites are complied with in several available procedures and are specifically embodied in the following: (1) wedge or "V" excision of tissue (seldom used because of infolding of surrounding adjacent surfaces), (2) enucleation of solid foci and cavities, (3) removal of a firm retracted airless segment or subsegment by stripping it along the adjacent anatomical cleavage planes from the periphery toward the hilum(7), (4) in larger lesions but still confined to one or two segments, an anatomical segmental resection can be performed(5, 6, 8, 9, 10). The procedures can be used singly

or in combination, being easily adapted to the particular indication noted by the surgeon at the time of thoracotomy.

Coccidioidal cavities are sometimes isolated, discretely located within the substance of the lung, and present on a flat surface or margin of a lobe without surrounding satellite infiltrations of any significance. Under these circumstances such a cavity can be easily and readily enucleated. This was done in the case of R. D. (Fig. 3) wherein the cavity was situated in the marginal surfaces of both upper and lower lobes. Any other procedure than enucleation would have required a much greater loss of tissue from both lobes.

When the preoperative diagnosis resolves itself around coccidioma, tuberculoma or neoplasm, thoracotomy is indeed indicated. Coccidiomas lend themselves to easy enucleation and though they may simulate tuberculomas the procedure is adaptable to either disease. Confirmation or a general interpretation of the disease entity at hand can be obtained from examination of the gross specimen or with the aid of frozen section done by the pathologist. If the immediate histopathological report indicates that the lesion removed is not granulomatous but neoplastic in nature further more radical resection can be performed. (This method is not unlike the routine practiced in the surgery of breast tumors.) However, it would be unusual for a peripheral neoplasm not to show considerable surrounding induration and other features characteristic of such lesions. Nevertheless the interpretation rests with the judgment of the pathologist and the operating surgeon.

Occasionally an upper lobe granuloma with cavitation simulates tuberculosis and the picture may even be confused with the finding of acid fast bacilli on concentrates; and as in the case of E. C. (Fig. 1) a history of one positive culture made the diagnosis more complex. At operation sebmental involvement permits no differentiation between the two diseases but segmental resection may be applicable to either one. Thoracoplasty on the other hand is not a satisfactory procedure for a chronic granulomatous process (other than tuberculosis) in such a location because some degree of suppuration is present which is usually the cause for the manifest symptoms. Also chronic granulomatous cavities not infrequently develop epithelialized linings, the cure for which is excision.

Because the lesions under discussion are practically all potentially dangerous if permitted to remain untreated, a patient usually will be benefited by operative intervention regardless of the preoperative assumptions regarding the disease process in question(11).

*Illustrative Cases**

Patient E. C.—This forty-four year old white male was admitted to the hospital July 31, 1951 (Figs. 1 and 2).

Fig. 1 (Patient E. C.)—Preoperative x-ray of the chest showing the large fairly thin-walled cavitary area in the right upper lobe region. Serial examinations had shown this excavated area to be increasing in size.

His history disclosed that in November 1943 while in the Armed Forces a chest x-ray revealed a smal larea of fibrosis in the right apex. This was believed to be of no clinical significance, and he was returned to full military duty. A follow-up x-ray in July 1945 was considered negative. In April 1949 an x-ray taken at a Veterans Hospital showed an infiltration in the right upper lobe. Sputums were negative for acid fast bacilli and he was discharged with a diagnosis of arrested tuberculosis. A subsequent examination in July 1950 revealed a possible cavity in the right apex with surrounding infiltrations. Concentrates of the sputum were negative for acid

*Patients E. C. and R. D. are included in an article to be presented by the author at the 32nd Annual Meeting of the American Association for Thoracic Surgery.

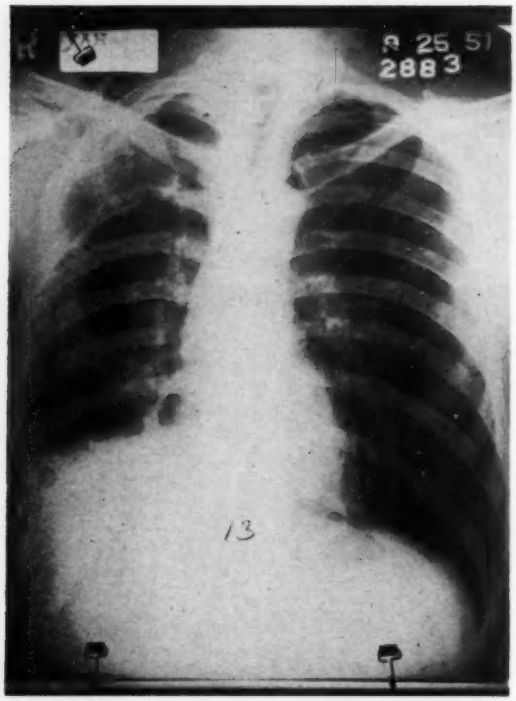

Fig. 2 (Patient E. C.)—Roentgenogram of the thorax about one month after operation. Examinations subsequent to this have increased clearing of the operated hemithorax.

fast bacilli. Repeat x-rays including tomographs in 1950 revealed a cavity in the right upper lobe. Tuberculin skin tests were positive in the second strength and an equivocally positive coccidioidin test was found. In May 1951 he was hospitalized at a Veterans hospital and a culture of the sputum for acid fast bacilli was said to have been positive. This examination, however, was never confirmed by subsequent studies.

Physical examination was essentially negative. Differential diagnosis resolved itself about coccidioidomycosis and pulmonary tuberuclosis and pulmonary resection was advised.

Operation Aug. 22, 1951. On entrance into the thorax the right upper lobe was found to be about half its normal size. This was due to the marked reduction of the volume of the apical and posterior segments which were firm and airless. Due to the dense fibrous adhesions extrapleural dissection of the involved segments was required. Two firm rounded foci were palpable, one in the anterior segment of the upper lobe and one in the superior segment of the lower lobe. These were enuclated during the procedure. The nodule in the superior segment was found to show evidence of central excavation but the nodule in the anterior segment of the upper lobe was solid and both contained amorphous caseous-like material. The cavity in the apical and posterioor segments was inadvertently entered and showed granular pinkish-white walls. There was some collection of detritus covering the lining. The segments were removed in the usual manner and no major leaks followed the resection and the enucleation of the foci.

Histopathological diagnosis: coccidioidal granulomata of the lung with cavitation.

Postoperative course. Postoperatively there was slow bleeding into the chest, probably on the basis of prolonged prothrombin time, necessitating transfusions. The complication of hemothorax in the recent operated area was treated with Varidase(SK-SD). This was the only eventful occurrance in his postoperative course and thereafter he had a satisfactory convalescence. He was discharged very promptly and was seen three months later at follow-up at which time continued improvement was evident.

Comment: As noted in the preoperative assumption the differential diagnosis lay between tuberculosis and coccidioidomycosis. Apical and posterior segmental resection of the right upper lobe was entirely satisfactory in this situation and was applicable to either tuberculosis or coccidioidomycosis. In addition it is to be noted that foci in the remaining portion of the upper lobe and superior segment of the lower lobe were removed during the course of the procedure. The nodule that was excavated in the superior segment may or may not have produced difficulty at a later date. By salvaging the anterior segment of the right upper lobe which showed compensatory enlargement and by only enucleating the focus from the superior segment the maximal amount of pulmonary tissue was salvaged in this particular instance with the chosen procedure (Fig. 2).

Patient R.D.—This eighteen year old white male was admitted to the hospital August 1, 1951 (Figs. 3 and 4).

His main complaint at that time was cough productive of musopurulent sputum of several months duration. In addition he had numerous psychosomatic disturbances and complaints related to various systems. However all the latter were ruled as having no organic basis and his pulmonary trouble was worked out completely. He had had a cough for about two years

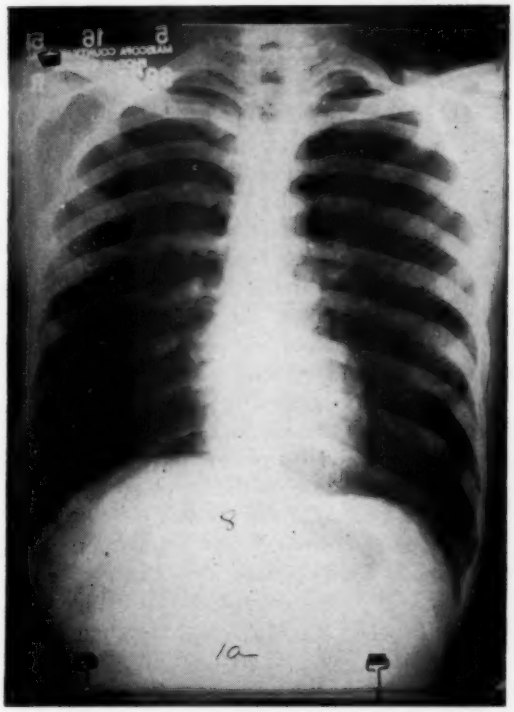

Fig. 3 (Patient R. D.)—Roentgenographic appearance of the lungs depicting the relatively thin walled ring-like shadow in the lower third on the left. At this time the impression was that this was a coccidioidal cavity.

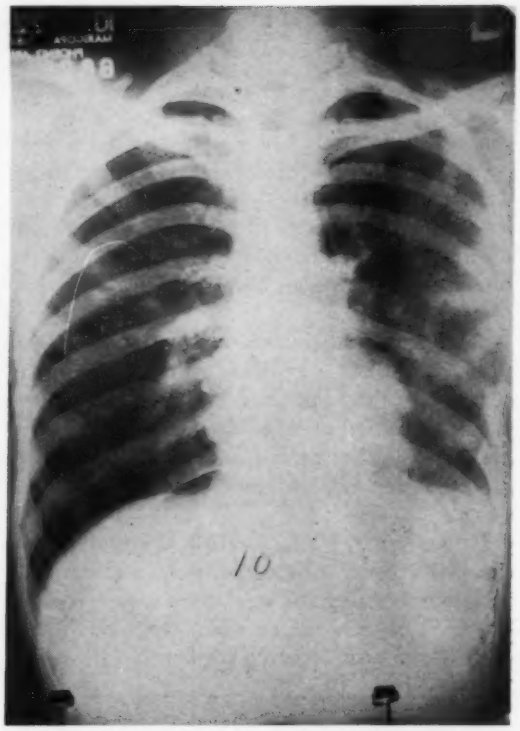

Fig. 4 (Patient R. D.)—A picture of the x-ray of the chest ten days postoperatively showing early complete re-expansion of the left lung following simple enucleation of the coccidioidal cavity which was situated in both lobes.

but during the year prior to his admission he began to raise mucopurulent sputum and occasionally this was greenish or grayish brown. He denied any frank hemoptysis. Work-up at the hospital showed a positive tuberculin skin test (first strength) and a positive skin test (1:100) for coccidioidomycosis.

Physical examination was essentially negative except for the chest. A few rhonchi were heard on deep and forced respiration over the left lower lobe posteriorly and in the axillary region. The sedimentation rate was 31 (Westergren method). Sputums were negative for acid fast bacilli on concentrate and by culture. An x-ray of the chest revealed a thin walled cavity in the left lower lung field with minimal adjacent mottled infiltrates (Fig. 3). This was considered to be a cavity due to coccidioidomycosis and from the history and observation it was thought to be infected.

Operation Oct. 5, 1951. On opening the thorax a few filmy and fibrous avascular adhesions were found over the fissure about the midaxillary region. Crossing the obliterated major fissure in its central portion there was a slightly indurated area measuring about four cm in diameter which by palpation indicated an underlying cavity. This lesion was found to lie about half in each lobe along the fissure region. During enucleation of the cavity, by blunt and sharp dissection, from the lobes it was inadvertently entered and a smal lamount of grayish-tan detritus escaped into the wound. Later the cavity was further opened and used as a guide in dissection as one would do in dissecting out a hernia. Very little air leakage and bleeding occurred along the plane of dissection. No attempt was made to close the defect in either lobe. Following removal of the cavity reinflation of the lung was prompt and only minor air leaks occurred.

Histoathological diagnosiss coccidioidomycosis (confirmed by culture).

Postoperative course. On the sixth postoperative day this patient developed spontaneous subcutaneous emphysema over the upper anterior chest and at fluoroscopy and by x-ray examination a hydropneumothorax was discovered.

With the aid of SK-SD, aspiration, and a closed thoracotomy the lung was immediately re-expanded and thereafter the patient's postoperative course was uneventful. He was discharged promptly from the hospital and continued his convalescence at the County Hospital for a short period. Subsequent postoperative x-rays revealed good expansion of the left lung although there was some fibrosis and peculiar ring-like pleural reaction about the operative site. Subsequently a bronchogram was done and this was shown to be of no significance.

Comment: Enucleation of the cavity in this instance without sacrificing either surrounding segment of the upper and lower lobe permitted the conservation of large amounts of pulmonary tissue. Any other procedure would have had to sacrifice functioning pulmonary parenchyma (Fig. 4).

Patient Mrs. W. F.—In 1946 this patient developed a cough productive of foul tasting and malodorous sputum. The sputum varied in small amounts. Shortly before examination in August 1951 hemoptysis occurred for the first time. Past history revealed that in 1944 an x-ray of the chest showed a cavity in the left upper lung field. This was treated as tuberculosis. Early in 1946 she was hospitalized and a left pneumothorax was instituted. This was maintained for over one year and finally abandoned because it seemed to be unsuccessful in closing the cavity. From 1947 to 1951 the patient had no further treatment and was only x-rayed on occasions. The physical examination was essentially noncontributory (Figs. 5 and 6).

Preoperative course. The lesion was thought not to be tuberculous but probably granulomatous in nature, possibly coccidioidomycosis. Sputums were negative for acid fast bacilli. A bronchogram was done and it showed a large cystic area in the left uper lobe with some cylindrical bronchiectasis in the involved segments.

Operation 8/23/51. On opening the thorax the apical posterior division was found to be contracted and firmly adherent to the chest wall necessitating partial extrapleural dissection. The apical-posterior segment was removed in the usual manner with conservation of the large remaining portion of the left uper lobe consisting

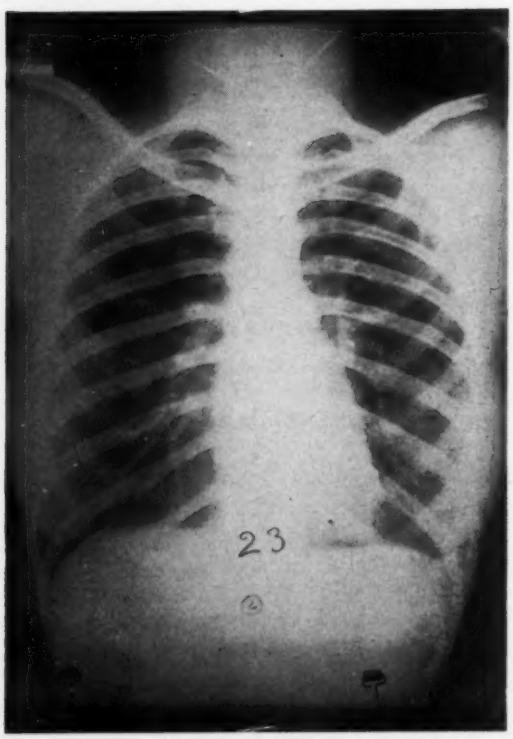

Fig. 5 (Patient Mrs. W. F.)—X-ray of the thorax following a bout of hemoptysis Aug. 1951, revealing a large thin-walled cavity in the upper lobe. Progress films from 1944 on showed an increasing diameter of the cavity but no satellite infiltrations were ever visualized.

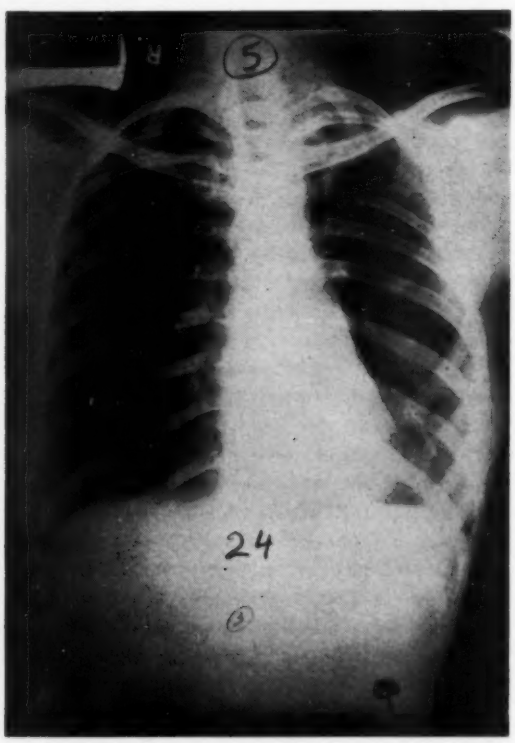

Fig. 6 (Patient Mrs. W. F.)—Postoperative x-ray of the chest following segmental resection of the diseased apico-posterior division and decortication of the left lower lobe.

of the anterior division and the lingular segment. When the lung was reinflated it adequately filled the chest and there was only a small defect in the outline of the lung where the apical-posterior segment had been removed. The lower lobe was partially incarcrated in a thick fibrous peel which stripped away with relative ease and this permitted good reinflation of the lower lobe. This fibrous peel was thought to be due to the irritative processes concomitant with the previous pneumothorax therapy. No additional foci were palpable in either lobe.

Postoperative course. The patient had a fairly uneventful postoperative course. At follow-up examinations which were conducted at one, three and five months the patient showed good postoperative progress (Fig. 6).

Comment: This patient undoubtedly developed an infected cavity with some degree of bronchiectasis as seen by the bronchogram and also in the pathological specimen. She benefited further from the operative procedure since the decortication of the partially incarcerated lower lobe was performed which increased her pulmonary function, at least from a clinical standpoint. This case well illustrates the recalcitrant nature of this particular type of lesion to pneumothorax in an attempt to close the cavity by that mode of therapy. As long as the cavity was relatively asymptomatic the patient might have gotten along indefinitely following her usual mode of living, however with evidence of bleeding and bronchographic evidence of bronchiectasis operative intervention was indicated. Although the original disease occupied a segment of some size, by the time operation was done this area of involvement had shrunken to a relatively small division of the left upper lobe and on removal of the diseased area there was no sacrifice of functioning pulmonary tissue.

Histopathological diagnosis: chronic granuloma, tiology undertermined. (The pathologist however noted it could be a coccidioidal cavity but no spherules were found.)

Patient F. McS.—This thirty-seven year old white male considered himself well when an x-ray of his chest was made during an x-ray survey in March 1951. (Figs. 7 and 8).

A rounded density was found in the right lung field on the x-ray. Although he was symptom

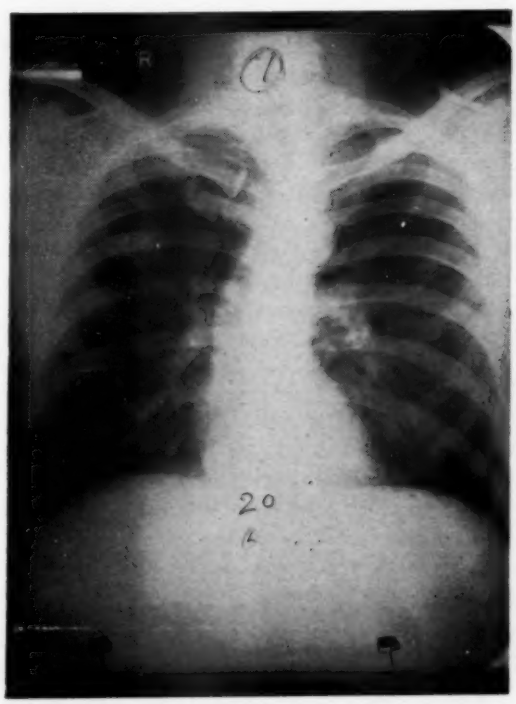

Fig. 7 (Patient F. McS.)—An immediate preoperative roentgenogram of the chest showing the large solitary rounded lesion in the upper half of the right lung. This nodule had increased about one-half in size in a period of about seven months.

Fig. 8 (Patient F. McS.)—Roentgenogram of the thorax made less than one month following the enucleation of the coccidioidal granuloma. The good result from the convervative procedure is evident.

free he saw his physician on learning of the x-ray findings. The cutaneous tests showed a strong coccidioidin reaction and a negative tuberculin. The complement fixation test for coccidioidomycosis was negative as was the precipitan test.

The past history and physical examination were essentially noncontributory. The diagonsis resolved itself about coccidioma, tuberculoma and neoplasm, and explatory thoracotomy was advised. By the time operation was performed on October 8, 1951 the lesion had shown some increase in size.

Bronchoscopy performed on the 25th of August 1951 was essentially within normal limits. No further data was obtained from the secretions obtained at the procedure.

Operation Oct. 8, 1951. On opening the thorax a fairly hard slightly irregularly rounded mass measuring about 3 cm in diameter was palpable in the posterior portion of the right lung crossing the major fissure which was incomplete. The major portion of the mass was found within the substance of the upper lobe and a small portion of it was imbedded in the adjacent contiguous lower lobe. The mass was firmly adherent to the parietal pleura posteriorly and this area was liberated extrapleurally. The surrounding adjacent lung tissue was well aerated and showed no induration and no additional nodules were palpable in any of the lung substance. The mass, after enucleation, was opened in the operating room by the pathologist and it presented a caseous center and a whorled laminated appearance of the surrounding layers about the softened central portion. The histopathological diagnosis was chronic granuloma. The culture showed fungi compatible with coccidioides. These were injected into a guinea pig and the diagnosis of coccidioidomycosis was confirmed.

Postoperative course. This man had an entirely uneventful postoperative course and was discharged from the hospital within a period of about ten days. He was back at work within three weeks. Subsequent follow-up examinations have shown no findings to indicate any regret for this exploratory thoracotomy. (Fig. 8).

Comment: In this particular situation the diagnosis easily resolved itself about a possible granuloma of tuberculosis or coccidioidomycosis and neoplasm was seriously considered. The nonneoplastic character of the lesion was determined at the operating table but further confirmation of the assumption that it was a coccidioma awaited culture studies and guinea pig innoculation. At operation it was noted that there was an incomplete fissure in the diseased area and unless enucleation had been carried out, considerably more lung tissue would have been sacrificed if a segmental type of resection in two lobes had been performed. However the lesion easily surrendered itself to enucleation from the surrounding tissues. The maximum amount of functioning pulmonary tissue was thus preserved.

Discussion: It is not to be inferred from this commentary that all cases of pulmonary granuloma can be managed in the conservative methods outlined. Not infrequently the disease process is so extensive or the complications resulting from the disease so severe that other procedures including lobectomy and pneumonectomy must be executed. The author's experience has been fairly concentrated to two major categories of granuloma, namely tuberculosis and coccidioidomycosis but judging by previous reports other granulomas presenting similar isolated nodular and cavitary forms can be managed in an identical manner (3, 4, 12).

Precedence to the use of the recommended technics is readily admitted, since all of the procedures have been applied previously in the treatment of coccidioidomycosis(4) and tuberculosis(5, 6). Too much stress, however. cannot be put on the conservation of pulmonary tissue and removal of only the major foci of the disease processes.

Cotton, quoted by Melick(4), has stated he has never seen coccidioidomycosis become reactivated following excisional surgery, as sometimes is seen after pulmonary resection for tuberculosis; his opinion apparently was obtained from a review of five hundred cases. By the same token the patient is not required to have thoracoplasty when a limited resection of pulmonary tissue is performed.

Although the details in the foregoing comments dwell around two major categories of granulomatous lesions, coccidioidomycosis and tuberculosis, recent evidence exists that histoplasmosis likewise occasionally lends itself to surgical consideration(11).

A word of caution should be instilled at this point regarding the possible simultaneous occurrence of granuloma and carcinoma. The combination of pulmonary tuberculosis and primary bronchial neoplasm has been observed on several occasions and recently a report has appeared on

the coexistance of bronchogenic carcinoma and cocidioidomycosis(13). Other primary pulmonary malignant neoplasms as well may occur concomitantly with granulomatous lesions of the lungs(13). The shadows of dual lesions cast in chest x-rays may be interpreted only as one entity which would prove disastrous if conservative management is prolonged and thoracotomy not effected.

In excisional surgery for tuberculosis, conservatism has stood the test of time in that no more complications are seen and reactivations are no greater in number with limited removal of lesions than when major portions of lung tissue are removed, yet large areas of functioning pulmonary parenchyma are preserved(5, 6).

There is little reason to doubt that similarly good results will prevail for other types of granulomas treated in a like manner by the methods outlined.

Summary

1. Granulomas of the lung are fairly frequent lesions and are caused by a variety of agents.

2. The differential diagnosis of a rounded solitary pulmonary lesion often lies among mycotic disease, tuberculosis and neoplasm.

3. These lesions may be indistinguishable from a roentgenographic point of view.

4. Frequently pulmonary granulomas especially tuberculosis and others of mycotic origin are suitably adapted to extirpation.

5. Conservative pulmonary excisional surgery with the objective of removing the major focus of disease with minimum sacrifice of functioning pulmonary parenchyma is frequently sufficient in the surgical management of granulomas.

6. An outline of the suggested methods of surgical management is given and illustrative cases are described.

REFERENCES

1. Forbus, W. D.: Granulomatous Inflammation, Charles C. Thomas, Publishers, Springfield, Ill., 1949.
2. Lovelock, F. J., and Stone, D. J.: Cortisone Therapy of Boeck's Sarcoid J.A.M.A. 147:930 (Nov. 3) 1951.
3. Good, C. A., Clagett, O. T., and Weed, L. A.: Granuloma of the Lung: A Problem of Differential Diagnosis, Tr. Nat. Tuberc. Assn. P 294, 1951.
4. Melick, D. W.: Excisional Surgery in Pulmonary Coccidioidomycosis, J. Thoracic Surg. 20:66, 1950.
5. Chamberlain, J. M., Klopstock, R.: Further Experiences with Segmental Resection in Tuberculosis, J. Thoracic Surg. 20:843, 1950.
6. Chamberlain, J. M., Storey, C. F., Klopstock, R. and Daniels, C. F.: The Small Pulmonary Lesion—Surgical Management, Tr. Nat. Tuberc. Assn. P 226, 1951.
7. Blades, B.: Conservation of Lung Tissue by Partial Lobectomy, Ann. Surg. 118:363, 1943.
8. Churchill, E. D., and Belsy, R.: Segmental Pneumonectomy in Bronchiectasis, Ann. Surg. 109:481, 1939.
9. Clagett, O. T., and Detering, R. A., Jr.: Technique for Segmental Pulmonary Resection with Particular Reference to Lingulectomy, J. Thor. Surg. 15:227, 1946.
10. Overholt, R. H., and Langer, L.: New Technique for Segmental Resection: Its Application in Treatment of Bronchiectasis, Surg. Gynec., and Obst. 84:257, 1947.
11. Brewer, L. A., Jones, W. M. G., and Dolley, F. S.: Nonmalignant Intrathoracic Lesions Simulating Bronchogenic Carcinoma—Report of Thirty Cases J Thoracic Surg. 17:439, 1948.
12. Hodgson, C. H., Weed, L. A. and Clagett, O. T.: Pulmonary Histoplasmosis: Review of Published Cases and a Report of an Unusual Case, J. Thoracic Surg. 20:97, 1950.
13. Hood, R. M.: Coexisting Bronchogenic Carcinoma and Coccidioidomycosis, J. Thoracic Surg. 20:478, 1950.

BASIC *Science* SEMINAR

"PHYSIOLOGIC CONSEQUENCES AS THE RESULT OF INTESTINAL OBSTRUCTION"

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Intestinal Obstruction—Definition: four essential symptoms characterize intestinal obstruction. (1) Detention or stoppage of the passage of the contents of the bowel. (2) Incessant nausea and vomiting which finally becomes fecaloid. (3) Sharp, colicy pain in the abdomen. (4) Distention which becomes progressively marked.

To these four cardinal symptoms we have to add to a variable degree according to the clinical form, the so-called general or systemic effects, metabolic changes, nervous reflexes, infection, and intoxication, which give rise to dehydration, electrolytic changes, cardiac collapse, abdominal shock, respiratory complications, peritoneal septicaemia, all of which are progressive and take the obstructed person to death if a correct treatment does not remove the obstacle to the fecal contents.

It is noted that this physiopathological definition does not correspond to a constant anatomic definition; that is, the cause may be variable and there are two great groups: (a) Functional obstruction, when it is due to an alteration of the intestinal motility; which can be either spastic or paralytic. (b) Mechanical obstruction, when an organic trouble stops the normal course of the intestinal contents.

It is the second group which is most important

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clinically. This also may be considered either an acute obstruction when the change is brought about suddenly, or chronic when the picture develops slowly over a long period. It may be partial when the occlusion does not block the circulation of all the intestinal contents, or complete, when this circulation is totally stopped. The level of obstruction must also be considered: high in the small intestine or low in the large bowel. The preservation of the blood supply must also be considered as strangulation will give rapid necrosis and destructioon of the tissues of the involved area.

This variability in causes, location and signs has led to a tremendous volume of research and speculation regarding the cause of death from intestinal obstruction (Vaughn pointed in 1950 that mortality from it still ranged 18 to 50 per cent). All these experimental studies have produced great improvement in the treatment of man. (Nemir stated in Feb., 1952, that mortality reported from the larger clinics still is in a range of 10 to 20 per cent).

When an obstruction occurs, various changes take place, locally in the bowel and systemically; these systemic or general effects are preceded and caused by the effects of the intestinal obstruction on the bowel wall and its cure can never be accomplished until the bowel has been restored to a normal state.

Local effects of obstructioon in the bowel—At the onset of obstruction locally there is an upset in the neuromuscular mechanism of the bowel to the obstructed point with increased peristalsis. The failure to remove the cause of obstruction results in an increase in the frequency and intensity of the peristaltic waves, this causes the characteristic cramping colicy pain. Continued obstruction results in a progressive distention of the loops above the obstruction. Many of the disturbances in the bowel functioon are produced by the intestinal distention and (Gatch) the distention of the intestine is a defensive action of the bowel to protect its blood flow because this blood flow through the intestinal wall depends on both the intraintestinal pressure and the diastolic pressure in the blood vessels, so, when the intraintestinal pressure equals or is greater than the diastolic pressure, the intestinal flow ceases. Vomiting thus occurs first reflexly and then in a progressive fecal character due to a disturbance of the normal gradient with reversed peristalsis. Progressive intestinal distention will stop normal peristalsis in all the rest of the intestine.

Just as distention first slows and then stops the intestinal flow, so absorptioon by way of the mesenteric veins will first be decreased and then stopped. Then solutes of low molecular weight pass readily through the bloodless bowel into the peritoneal cavity.

Many experiments have been done to try to prove that there is some absorption from the obstructed bowel by way of its lympathics, but it has been concluded (McIver, White, Gatch, Sperling, Wilkie) that there is either none or very poor absorption by way of the blood or lympth vessels.

Distention affects absorption: (1) by diminishing the volume flow through the intestinal wall; (2) by altering the physical forces involved in absorption; (3) by damage of the intestinal wall which affects both the vital activity of the mucosa and the physical forces which promote absorption.

Statements of various writers about the effect of distentioon on secretion are contradictory, but there is an accumulation of normal secretions and a varying admixture of transudates and exudates (depending on the presence or absence of strangulation), and it is to be remembered that in the upper segments of the bowel there is a more rapid accumulation of secretions.

Bacterial multiplication take place in the obstructed loops so that the small intestine which normally shows few bacteria becomes quickly loaded with microorganisms, (the presence of Cl. Welchii has been consistently demonstrated in loops in experimental obstruction).

Effects of the obstruction on the mesenteric vesselss Gangrene of the bowel can be caused by distention alone (decrease flow, venous stasis, circulatory stasis that brings anoxemia of the bowel wall, hemmorrhage, impairment of viability, gangrene and finally increase permeability and peritonitis), but gangrene is usually due to obstruction of the mesenteric vessels. These may be occluded by thrombor emboli, or they may be compressed by twisting or incarceration of a loop of bowel beneath an adhesion or by the ring of a hernia. Arterial obstruction is much less dangerous to the bowel than venous obstruction. (Incarceration usually obstructs the mesenteric veins but not the arteries, this ruptures the capillaries of the bowel because it subjects them to the full force of the systolic pres-

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sure, gangrene and putrefaction follows). Distention will protect the capillaries of the bowel against rupture, this explains why bowel incarcerated in a hernia is usually tightly distended (and also explains why it is so seldom gangrenous)(Gatch).

The gases found in obstructed bowel are: nitrogen 70 per cent, carbon dioxide 6 to 12 per cent, oxygen 10 to 12 per cent, hydrogen sulfide 1 to 14 per cent and small amounts of methane and hydrogen(Morton, Schilling). The source of these gases is principally swallowed air which contributes 68 per cent, the remaining 32 per cent arises principally from diffussion into the obstructed loop from the blood stream and from putrefaction.

Intestinal Pathology. The intestine is found with marked distention above the obstruction and collapsed loops below. The distended loops may reach three to four times normal size. The walls become uniformly dusky red and there is evidence of dilatation of the capillaries and small blood vessels. There is usually edema of the wall of the bowel. The splanchnic engorgement in the area of obsrtuction is perhaps the most striking pathological lesion. When the distention has been considerable it is not at all unusual to find areas of focal necrosis in the mucosa specially in the antimesenteric border, where the blood supply can be most effectively shut off.

Sometimes this necrotic areas involve the entire wall of the bowel and only the serosa prevents perforation. The mucosa is deeply injected and always contains hemorrhagic patches, there may be acute and chronic inflamatory cell infiltration. The contents of the obstructed loops are usually foul smelling, reddish brown fluid with a peculiar cadaveric odor, quite characteristic when once perceived, combining the odors of decomposing tissues and blood. Peritonitis may be present and should be considered a complicating rather than a primary factor. Calihan et al reported an incidence of peritonitis of 55 per cent in fatal cases of intestinal obstruction. There are no changes of consequences noted in the heart, lungs or central nervous system; the liver and kidneys may at times show a little cloudy swelling but histological changes are in no way characteristic.

Systemic effects of small bowel obstruction. These are different and vary with the level of obstruction, the presence or absence of strangulation and the length of time that obstruction may have been present.

Effects of simple high obstruction. Productive and persistent vomiting, weakness, muscular tremors, oliguria, tachycardia and finally coma are the main symptoms; dehydration and alkalosis the striking findings. Prevention of absorption of the gastrointestinal secretions (from 5 to 7 liters of saliva, gastric juice, pancreatic juice, bile and intestinal secretion) by vomiting, robs the plasma of an inmense quantity of water that is accompanied by a great loss of electrolytes. The evidence seems conclusive that death from untreated high obstruction is due to acute loss of water and electrolytes; this is suported: (1) by the magnitude and serious consequences of this loss; (2) by the fact that animals with high intestinal fistulas through which secretions of the upper gastrointestinal tract are drained to the exterior show the same symptoms, have the same blood chemistry findings and die in the same length of time as animals with high intestinal obstruction; (3) by the experimentally demonstrated fact that when secretions lost by vomiting due to high obstruction are returned to the bowel through an enterostomy below the site of obstruction, life and good health are maintained.

Hartwell and Hoguet were the first in recognizing the importance of replacement of salt in intestinal obstruction, Haden and Orr in a long series of investigations established the facts of a constant reduction in chlorides in all simple obstructions. Gamble and McIver outlined the importance of sodium in the maintenance of the acid-base balance; after Darrows works about potassium changes in children with diarrhea and vomiting, the role of potassium in body fluid pathology has added greatly to the understandings of electrolyte changes.

Effects in simple low obstruction. Dehydration, electrolyte loss, blood volume reduction with hypoproteinemia, shock and circulatory collapse and death are progressive steps in simple low obstruction; this is explained by Gatch and Battersby: (a) that intraperitoneal loss of blood protein is considerable when the bowel is inflated; (b) that blood concentration occurs even when the bowel is inflated with pressure too low to damage it or to cause any noteworthy loss of fluid into the peritoneal cavity; (c) that experiments shows that distention of the stomach causes more rapid development of blood concen-

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tration and earlier death than inflation of the bowel.

The same authors believe that blood concentration is due to interference with respiration, by damage of capillarly endothelium of the whole body (because of asphyxia caused by bowel distention) with escape of blood proteins into the intercellular spaces. Alkalosis and electrolyte loss has a great deal to do with blood concentration and blood protein loss.

Effects in colonic obstruction. Symptoms and signs are less prominent, even with great colonic distention; in these cases, obstipation, distention and abdominal pain are marked, and the other signs such as vomiting with dehydration and blood concentration occur late. This explains clearly why colonic obstruction is better tolerated by these patients, and it is generally believed that toxemia has a more important role in this process. When the iliocecal valve is incompetent the obstruction is essentially the same as a low ileal obstruction.

Effects in strangulation obstruction. When strangulation is present in either high or low obstruction the problem is much more acute; reduced blood volume and circulatory collapse are early prominent features, and, as always, there is simple obstruction proximal to a gangrenous segment of bowel. The signs of simple obstruction will be added, with dehydration and alteration of the acid-base balance.

The effects of gangrene of the bowel depends upon what part of the bowel and what length of the bowel are involved and also upon the cause of gangrene.

Loss of blood to the circulation in cases of mesenteric thrombosis is sufficient in itself to account for death. In cases in which short segments of bowel are incarcerated that loss of blood will be inconsequential and the chief effects will be due to obstruction and infection of the gangrenous loop. Observers are amazed at the different reaction of patients to infection and the power of peritoneum to wall off and prevent spread of infection. (Recent publications have established the finding of an abnormal pigment, a hemin derivative not previously reported in vivo, first in the gut lumen about 12 hours after strangulation, then in the peritoneal cavity and finally in the blood stream(Nemir, Hawthorne, Cohn). Notwithstanding all these facts there is no doubt that infection has much to do with the local and systemic effects of strangulation of the bowel is the chief cause of death from the lesions.

Classic theories about death in intestinal obstruction. For a long time three theories have been presented to explain the cause of death in intestinal obstruction. The nervous reflex theory attributed the collapse and lethal effects of intestinal obstruction to an irritation of the nerve filaments of the intestinal wall (comparable to the collapse caused by trauma to the abdomen). Repeated experiments have proved that denervation has but little efect on survival time(Fine, Rosenfeld(Gendel).

The theory of the bacterial infection of the organism by passage onward of bacteria from the intestinal lumen into the blood stream and peritoneum and the theory of autointoxication were proven false with the studies in dehydration which prove that obstructed animals can be maintained a long time by the administration of salts and water.

Circulating blood of animals dying of intestinal obstruction is nontoxic to normal animals; strangulated loops contents may be introduced into the normal intestine without effect; Wangesteen and Chum claim that normal secretions are as toxic as the fluid above the points of obstruction. The theory of mucosal origin of the toxin is controverted by the lack of toxicity of mucosal preparations when bacteria are eliminated. As no absorption can be demonstrated from the obstructed loops, bacterial infection cannot be accepted, besides no bacteria have been found in the circulating system. All observers are agreed that the higher the obstruction the more fatal is the outcome. At present in light of more recent studies most of the lethal changes can be explained on the basis of mechanical factors and metabolic disturbances leading to a reduction of body fluids and circulating blood volume

Summary

The local and systemic effects in the body of the different types of intestinal obstruction have been summarized.

There is not one theory to explain the cause of death by intestinal obstruction; nervous reflexes, intoxication and infection all have to be considered in variable degrees depending on the type of obstruction.

Simple obstruction at any level in the absence of dehydration and distention is not a lethal process.

When distention occurs rapidly, strangulation

results, and the fatal chain of events can be explained largely on the basis of infection and local plasma and blood loss with electrolytic disturbances.

When distention occurs more slowly without evidence of strangulation, dehydration and starvation alone may account for death.

BIBLIOGRAPHY

1. Physipathology of Intestinal Obstruction.—J. Missouri M. Ass 16-402 Dec. 1919.
2. Motor activity of distal bowel in Intestinal Obstruction.—Wangesteen O. Carlson. Proc. Soc. Exper. Biol. and Med. 27:676, 1930.
3. Miura Y. An experimental study in Pathogenesis of Ileus. Keijoj. Med. 3:109, 1932.
4. Stout, Gurn: The Pathological Physiology of Ileum as a Basis for Treatment. The American Journal of Surgery, 19:283 February 1933.
5. Holt, Herbert: The Pathology of Acute Strangulation of the Intestine. The British Journal of Surgery, 21:582 (April) 1934.
6. Donaldson, J. K. and Stout, B. C., Mechanism of Absorption in Intestinal Obstruction with Surgical considerations, Texas State Journal of Med. 30:455 (Oct.) 1934.
7. Mullen, P. B., Clinical Pathological Phases of Intestinal Obstruction. Western Journal of Surgery. 44:636 (Nov.) 1936.
8. Storck, Ambrose, Rothschild, J. E. and Alton, Ocshner: Intestinal Obstruction due to intraluminal foreign bodies, Annals of Surgery, 109:844 (May) 1939.
9. Gatch and Battersby: The two stages of Bowel Distention and the effect on the Volume and Concentration of the Blood, Archives of Surgery, 44:108 (Jan.), 1942.
10. Gallart Mones F. Physiopathology of the Syndrome of Acute Obstruction of the Small Bowel, El Dia Medico, 17:317 April 9) 1945.
11. Sawyer, Kenneth C.: The Management of Acute Intestinal Obstruction, Northwest Medicine, 45:735 (October) 1946.
12. The Diagnosis and Treatment of Acute Malignant Obstruction of the Large Bowel, New Orleans Medical and Surgical Journal, 100:397 (March) 1948.
13. Diagnosis of Intestinal Obstruction in the Newborn, Carlson et al. California Medicine, 70:240 (April) 1949.
14. Gamble, Hugh A.: The Roll of Obstructive Enterostomy in the Treatment of Obstruction of the Small Intestine. Southern Medical Journal, 42:480 (June) 1949.
15. Parssonet, Eugene: Diagnosis and Management of Small Bowel Obstruction, Journal of the Medical Society of New Jersey, 46:270 (June) 1949.
16. Vaughn, Arkell M.: Acute Intestinal Obstruction, Illinois Medical Journal, 97:20 (January) 1950.
17. Cole, Warren H.: Intestinal Obstruction, California Medicine, 73:384 (Nov.) 1950.
18. Barnes, Bernard: Acute Small Bowel Obstruction, Journal of Iowa State Medicine Society, 41:43 (February) 1951.
19. Mahoney, E. B. and Sherman, C. D.: The Management of Acute Small Bowel Obstruction, New York State Journal Of Medicine, 51:370 (February 1) 1951.
20. Putney, C. W.: Intestinal Obstruction, Virginia Medical Monthly, 78:342 (July) 1951.
21. Coler, F. R. and Berry, R. E.: Fluid and Electrolytic Balance in Intestinal Obstruction, Minnesota Medicine, 34:414 (May) 1951.
22. Scudder, J., Swemer, R. L. and Truszkoswki: Potassium in Acute Intestinal Obstruction, Surgery, 1:74, 1937.
23. Randal, H. T., Habif, Lockwood and Werener: Potassium Defficiency in Surgical Patients, Surgery, 26:341 (Septmber) 1949.
24. Taylor, Ross, Potassium In Electrolytic Balance. Journal of the Michigan State Medical Society, 49:793 (July) 1950.
25. Evans, Everett I.: Potassium Defficency In Surgical Patients, Annals of Surgery 131:945 (June) 1950.
26. Crews, E. R.: Potassium Depletion. Texas State Journal Of Medicine. 47:291 (May) 1951.
27. Darrow and Pratt.: N. England Journal Of Med. 242-978 1950.
28. Nemir, P.: Progress Report In Intestinal Obstruction. Am. Journal of Medical Sciences. 958-198 (February) 1952.
29. Laufman, H., Tanturi. Furr.—Recovery of Bacterial Enzymes From Thoracic Duct In Intestinal Strangulation Obstruction. Surgical Forum, Saunders 1951-129.
30. Gatch: Intestinal Obstruction. Lewis Practice of Surgery. Vol. VII Ch. 6, 1951.
31. Turmen, H. Intestinal Obstruction. Bockus Gastroenterology, Ch. LV, 258, 1944.
32. Morton, J., Schilling, J.: Obstruction of Small Intestine. Cyclopedia Of M. S. and S. Davis. Vol. VIII. 433-456, 1951.
33. Wangesteen, O. H.: Intestinal Obstruction 2nd Ed. 1942.
34. Forgue. Occlusions Et Obstructions Intestinals. Traite du Patologie Ext. 1934.

PHOENIX *Clinical* CLUB

PHOENIX CLINICAL CLUB CASE DISCUSSION

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

A fifty-five-year-old woman entered the hospital because of hematuria.

Ten days before admission the patient first noted hematuria associated with frequency and pain in the left flank. Three days later she entered another hospital, where x-ray films of the abdomen were said to reveal no "stones". Following a bladder irrigation the bleeding ceased for about one week and she was discharged from the hospital. The day following discharge bright-red blood and some clots were passed, accompanied by pain in the left side.

There was no history of recent weight loss. Thirteen years previously a hysterectomy had been performed for the removal of a "benign tumor".

On physical examination there was a questionable fullness in the region of the left kidney. The remainder of the examination was negative.

The temperature was 99.6°F., the pulse and respirations were normal and the blood pressure was 135 systolic, 80 diastolic.

Examination of the blood disclosed a hemoglobin of 10.5 gm., a red-cell count of 3,280,000 and a white-cell count of 11,900. The urine was cloudy red in color, had a specific gravity of 1.020 and gave a four plus test for albumin; the sediment was loaded with red cells. The serum nonprotein nitrogen was 29 mg. per 100 cc.; the Hinton test was negative.

An intravenous pyelogram on the day following admission demonstrated kidneys of normal size and shape. A normal kidney pelvis and ureter were visible on the right. During a 45-minute period no excretion took place on the left. The urinary bladder contained a large filling de-

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fect. (Cystoscopy was negative). A left retrograde pyelogram showed the lower calyx pressed on and displaced upward by an approximately round mass. On the periphery of the mass there were small areas of calcification. The upper ureter was displaced medially by the mass.

Urine taken on the third hospital day by catheter from the left ureter was loaded with red cells and gave no growth on culture.

On the fourth day the patient was given a transfusion and an operation was performed.

PALMER DYSART, M.D.

In the presence of an obvious space-consum-lesion of the left kidney, palindromic unilateral renal purpura does not have to be considered as an explanation of the hematuria which was the major symptom and finding in this case. Likewise, renal pelvic and ureteral causes can be eliminated. Aparently, also, extra-renal causes do not require consideration for it is stated that intravenous pyelogram demonstrated kidneys of normal size and shape without any described distortion from extrinsic pressure. It is stated, perhaps paradoxically considering the normal description of the size and shape of the kidneys, that the upper ureter was displaced medially by the mass in the lower pole of the left kidney. To freely grant the veracity of both statements regarding the interpretation of the pyelographic findings would intimate that the mass displacing the ureter does not have the same radiolucency of renal tissue, and may not be a solid tumor. Other than this there is no statement nor inference regarding the radiographic density of the mass, although there must be some evident difference between it and the renal density to permit its description as an approximately round mass, although the small areas of calcification described on its periphery may be the means by which it was outlined. The size of this mass is not stated.

As for the aparently conflicting statements about a large filling defect in the urinary bladder while cystoscopy was negative, time could be spent on that, but discussion of space-consuming lesions of the kidney may be more profitable, at least from a didactic standpoint.

The anemia could be the result of many causes, but for lack of more information, only two conditions can be considered; hemorrhage from the left kidney and the debilitating effects of malignancy. There is not much information given which will assist in differentiating between these two. There is no mention of this patient's general condition, her weight, or any inference of progressive changes.

So much for the stated facts. Now, one deducible fact stands out; that is that calcification spells chronicity. Chronicity mitigates against primary malignancy, but does not rule it out, nor is secondary malignant degeneration eliminated by it. Calcification is found occasionally in malignant lesions.

Calcification in the wall of a simple serous cyst of the kidney is seldom seen, but it is found frequently in echinococcus cysts. Echinococcus disease is rare in the United States. The kidney is involved in about 2.5 per cent of instances. Such a cyst of the kidney is most often mistaken for renal malignancy or simple cyst. In about 20 per cent of these cysts the wall becomes calcified and degeneration of the contents results.

There is another type of cyst whose wall usually becomes calcified, and although it is not actually a true renal cyst, it is classed with them. This is the perirenal cyst, a rare clinical entity which is intimately associated with the fibrous renal capsule and is distinguished from pararenal cysts which are external to the fibrous renal capsule. Neither are directly associated with renal substance. It is difficult to explain the origin of a cyst so intimately associated with the renal capsule on a developmental basis although embryonic rests from Wolffian or Mullerian ducts is a possibility. Trauma with hematoma of the renal capsule and subsequent cyst formation is suspected but in the few cases reported in the literature definite evidence of previous trauma is absent.

Before discussing the common types of renal tumors that must be considered in the diagnosis of the space-consuming lesion presented, there is an unrelated group of lesions which is rare, but without the final evidence of pathologic tissue examination cannot be ruled out. This group consists of progonoma, teratoma, choristoma and hamartoma. The common factor which places them in a group is the abnormal embryonic developmental growth control of tissue, and such tumors may, like normal adult tissue, develop true malignant features.

Progonoma is the appearance and persistence of tissue resulting from fetal atavism to a stage which does not occur in the life history of the species, but which disappeared during the evol-

utionary phase of development from its ancestral forms.

The term teratoma has a restricted application to a group of tumors composed of recognizable tissues and complex organs with a lack of orderly arrangement, derived from more than one embryonic germinal layer.

Choristoma is a neoplasm of abnormally placed normal tissue developing from a displaced embryonic anlage.

Hamartoma is a tumor due to overdevelopment of some tisue element which belongs normally at the site where it is found, or to an abnormal relationship of a normally situated tissue element. Although these lesions are composed of mixed elements, they are not true teratomas, and are essentially benign. In the urinary tract, hamartoma has been found mainly in the kidney cortex. It may occur clinically as an isolated entity or as a part of the syndrome known as tuberous sclerosis complex, where the lesions represent a widespread developmental anomaly, often hereditary, in which the primary abnormality lies in the faulty differentiation of tissue rather than of body units, although the latter may be included. The lesions represent a dysplastic rather than a neoplastic development, and can occur in any tissue of the body. Renal tumors occur in 80 per cent of the cases, and are rarely diagnosed during life, probably because they are quite benign and asymptomatic except for infrequent hematuria, and because patients with tuberous sclerosis complex usually die early in life. The clinical diagnosis of this complex is possible if two or more of the following features can be demonstrated: mental retardation, epilepsy, adenoma sebaceum, phacoma of the retina, multiple mixed tumors (hamartomas) of the kidney, and a familial history of the disease.

A review of the literature dealing with renal tumors by Moore reveals that approximately 95 per cent are malignant and that the majority of these are carcinomas or adenocarcinomas of cortical origin of the type formerly designated hypernephromas. Renal tumors fall into two rather distinct age groups; those of infancy and childhood, the majority of which are of mesoblastic origin; and those occurring after middle age, relatively few of which are of this type. In 1948 Culp and Hartman reviewed the literature concerning tumors of mesoblastic origin in the adult, and advocated a simplified classification. Embryonal nephroma arising from the pelvis is termed a mesonephric nephroma, and originating in the cortex is a mesoblastic nephroma which may be carcinoma, sarcoma, mixed cell or undifferentiated. Such tumors are rapidly growing and are accompanied by a lower incidence of gross hematuria.

Foot, Humphreys and Whitmore in a review of 295 cases of renal tumor in which there was pathologic confirmation classified these tumors upon a basis of their tissue origin and found 24 benign and 271 malignant tumors. Of the malignant tumors 210 were carcinomas derived from renal tissue, 47 were from embryonal rests, nine were derived from supportive tissue, and five were from extrinsic sources by invasion or metastasis.

They concluded that histologic factors which are of prognostic value following nephrectomy are that those renal cell tumors with clear regular cells having isomteric nuclei, arranged in cords and strands with thick dense septa offered the best prognosis; while those with irregular granular cells having anisometric muclei arranged in tubules and papillae with irregular thin septa offered the poorest prognosis. Hemorrhage and cystic degeneration were considered favorable factors of secondary importance.

Size of a malignant tumor is also of prognostic importance, for they are usually surrounded by a definite fibrous capsule during their early growth. Penetration of this capsule is a late phenomenon. With respect to the relationship of size of a tumor to metastasis, Bell in a study of 153 malignant renal tumors found that of those under 5 cm. in diamenter, only 7 per cent had metastasized, whereas 83 per cent of those over 5 cm. in diameter had metastasized.

Cysts of the kidney may be of any size, either single, multiple, or multiloculated. They may develop at any point within the renal parenchyma. They rarely produce the severe constitutional symptoms of cortical tumor, such as weight loss, emaciation, anemia, fever and the other findings of malignant neoplasms. They may mimic gastrointestinal diseases or produce local or referred pain purely by the pull of their weight. Hematuria is not uncommon. Most renal cysts of this type are asymptomatic and have been discovered inadvertently during the course of x-ray or general physical examination.

The most important diagnostic feature is the appearance of the x-rays in which the cysts often

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have a distinctly different appearance than solid tumors. The mere fact that a large, circular mass is found attached to the upper or lower pole of the kidney without evidence of metastasis or constitutional symptoms alone suggests cystic disease instead of cortical renal tumor. Renal cysts are more likely to produce a circular shadow with an even contour in the x-ray film and as a rule do not result in much change in the outline of the kidney. The extent of the deformity in the calcyces and pelvis depends on the position and size of the cyst. The calyceal and pelvic defect is usually crescentic and even in outline rather than irregular as when an infiltration process is present. Cysts tend to grow away rather than into the kidney substance so that the involvement of the cortex is often minimal unless the cyst happens to be located in the center of the kidney. In tumor the density is likely to be greater than that of cyst, and in the latter the outline of the psoas muscle may not be obliterated.

Infection may constitute or simulate a space-consuming lesion of the renal parenchyma. An abcess or carbuncle of the kidney may be located anywhere in the kidney substance. Cicatrization incident to chronic pyelonephritis may produce a deformity that resembles a space-consuming lesion.

Malformations of the renal pelvis frequently simulate a space-consuming lesion of the parenchyma. An appearance of spreading apart of the calyces may be produced by bifid kidney, and less commonly as the result of malrotation which usually yields the picture of diffuse deformity. Malformation of one calyx may give the pyelographic picture of compression or elongation. This appearance may also be produced by peripelvic fat accumulation.

Following injury, the presence of blood or the development of scars may produce a deformity suggestive of a mass within the kidney.

Clinically, it is often impossible to diffenentiate between these malignant and benign lesions. Various symptoms and signs may be helpful, yet none are pathognomonic. The history may suggest a traumatic lesion. a febrile course may indicate a carbuncle or abscess, but the differentiation between early tumor, cyst or anomalous formation of the renal pelvis may present tremendous diagnostic difficulty. While bleeding from the kidney is more suggestive of renal tumor, it also occurs in approximately ten per cent of serous cysts. Although a perfectly round pyelographic filling defect may suggest a cyst, the identical findings may be produced by early neoplasm. An elongated cephalic calyx may suggest renal neoplasm as well as anomalous formation of the pelvis. While malignant renal tumor may be suspected because of gross hematuria or microscopic blood in the urine when suspicious defects are seen in pyelograms, but if the Papanicolaou smear is negative for malignant cells, only by actual tissue examination either by biopsy or following nephrectomy can a certain diagnosis be made.

Although conservatism is a prime consideration in renal surgery, many kidneys have been sacrificed needlessly because of suspected neoplasm. When exposure of the kidney reveals an obviously benign lesion, such as a cyst, removal of the cyst is the accepted procedure. However, in cases in which the findings suggest the possibility of tumor, if a benign lesion is not evident upon external inspection, nephrectomy has been considered mandatory. A possible alternative, incision into the kidney for diagnostic purposes, has been condemned, since it is alleged that there is danger of disseminating tumor cells if a malignancy is present, and a small tumor may escape detection.

The hazard of disseminating tumor cells may be greater in a vascular organ such as the kidney. It is recognized that most renal tumors are highly malignant. Malignant cells have been shown to be less cohesive than normal cells, and metastasis is enhanced by manipulation.

I have found two references in the urological literature of the past year regarding methods of biopsy of the kidney that contradict the customary attitude toward such a procedure. One is applied to suspected cysts, and the other is a method of safely exploring the kidney in the presence of possible malignancy.

Ainsworth and Vest at the University of Virginia Hospital advise the aspiration of a suspected cyst with a spinal needle and injection of excretory contrast medium. As a precaution against the remote possibility of concomitant malignant tumor Papanicolaou smears are made. If a hemorrhagic cyst is encountered the possibility of malignancy is 25 to 35 per cent. It has been generally accepted that surgical exploration for all space-occupying lesions of the kidney is an immediate necessity, but it is the belief of these authors that exploration is neither desirable nor

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necessary in most instances of so-called solitary cysts of the kidney when the diagonsis can be confirmed. When symptoms of pain, discomfort, excessive hematuria or evidence of progressive cortical damage are present, then excision is in order. Operations for the removal of cysts from the kidney are not always simple and the necessary suturing to control bleeding may inactivate more cortex than would the presence of the cyst had it been allowed to remain. Two controversial questions will arise with respect to this procedure. One concerns the inadvisability of inserting a needle into a possibly malignant tumor, but the authors believe the prediction of a cyst can be made with considerable accuracy. The second point that of the possibility of overlooking a coexistent malignant tumor is important. There are few references in the literature concerning the association of malignant cortical tumors and cysts of the kidney. The renal cystogram advocated would show irregularity of the cyst wall in the presence of papillary tumor as in papillary cystadenoma. Also, there have been few chance associations between separate cysts and solid tumors.

Weyrouch, Wanless, Goebel and Scott of Stanford University Medical School, University of California Medical School and the Veteran's Hospital in San Francisco have studied the dangers attending biopsy of the kidney in the presence of a malignant tumor, and developed a method of procedure. It was found by them that the safety period for occlusion of the vascular pedicle is more than adequate to permit the most painstaking biopsy, including time for frozen section if necessary. By the use of radioactive tracer substances they have shown with tourniquet occlusion of the renal pedicle and clamping of the ureter there is little possibility of dissemination of tumor cells during biopsy procedure.

The successful use of renal biopsy depends upon the careful selection of cases. It is indicated only in those patients with pyelographic findings suggestive of a small, localized, space-consuming lesion of the parenchyma. Biopsy is not indicated when the diagnosis of malignant tumor has been established, as by Papanicolaou technic, when a kidney is functionless, in large neoplasms which are obvious on external inspection, nor for obscure, unexplained bleeding from one kidney when the pyelogram yields no clue to the nature or location of the lesion.

In the case at hand I do not believe that an accurate pathologic diagnosis can be made from the information given except on a basis of probability. It is even possible that a dormant metastasis to the left kidney occurred from the "benign tumor" for which a hysterectomy was performed thirteen years before. I suspect the presence of a solitary renal cyst, but for reasons covered in the discussion, and from 21 years experience in the discussions of the Phoenix Clinical Club, I doubt the wisdom of making such a simple diagnosis. And besides, such a diagnosis would probably not account for the areas of calcification found by x-ray. Therefore, I will make a diagnosis of space-consuming lesion of the lower pole of the left kidney, probably a cortical carcinoma.

Discussion at Massachusetts General Hospital

Dr. Walter S. Kerr, Jr. A fifty-five year old woman, ten days before entering the hospital, noted hematuria associated with pain in the left flank and with frequency. The bleeding persisted for approximately three days, stopped for about one week and then recurred. Again, it was accompanied by pain in the left side. The patient had noted no weight loss or previous symptoms referable to the urinary system.

One examiner noted a questionable fullness in the left flank. Otherwise the physical examination was negative. Cystoscopy was negative and a retrograde pyelogram showed a "large mass in the region of the lower pole of the left kidney." Laboratory studies revealed the expected anemia and a urine loaded with blood.

Thus, I am faced with the problem of deciding the nature of a large mass in the lower pole of the left kidney of a fifty-five-year-old woman who has had severe hematuria accompanied by left-flank pain on two occasions in the past ten days.

Dr. McCort, would you kindly discuss the x-ray findings?

Dr. James J. McCort. The intravenous pyelogram is not available. We have one film taken during the retrograde pyelography. The catheter is seen in the left ureter. After the retrograde injection of dye, a large soft-tissue mass in the lower pole of the left kidney is visualized. There is a suggestion of a slight flecky calcification in the periphery of this soft-tissue mass. The inferior calyx is not visualized. Flattening and upward displacement of the middle calyx and pelvis with some intraluminal protrusion of the mass into the left kidney is apparent. Wheth-

er this represents blood clot or tumor extension cannot be determined. There is also displacement of the upper third of the left ureter toward the midline. The psoas muscles are symmetrical. The visualized bones show no abnormality.

Dr. Kerr. The x-ray appearance of the lower pole of the left kidney in this case could be caused by a number of tumors, most of them unlikely. Solid retroperitoneal tumors such as lipomas, fibrosarcomas and their variations have on occasion caused the calyceal and pelvic pattern noted and have appeared to be part of the kidney. Usually, however, retroperitoneal tumors, if they affect the kidney at all, only cause displacement, without changes in the calyceal pattern.

Rare tumors arising in the kidney, such as solid benign tumors, teratoid tumors and hamartomas, are to be thought of only from the point of view of completeness. Carcinoma of the kidney pelvis will have to be mentioned in passing; these tumors usually cause hematuria before they become as large as this mass. Carcinomas of the kidney pelvis are more likely to give a positive Papanicolaou strain than renal-cell carcinomas, which originate in the cortex of the kidney. A perinephritiv abscess is a remote consideration in view of the white-cell count and the history.

A solitary cyst and a renal-cell carcinoma (hypernephroma) are the most likely bets in this particular case. They are the most common kidney masses in adults. The x-ray appearance of this mass could be caused by either a cyst or a hypernephroma. As Dr. McCort has pointed out, there is calcification in the periphery of the mass. In my experience calcification is more common in renal-cell carcinomas than in cysts. Arteriograms are said to be helpful in differentiating these two lesions. However, the evidence they produce is not sufficint for me to decide to not operate—especially when tumors may occasionally occur within cysts. Medial displacement of the upper portion of the preter is the last of the x-ray findings to be discussed. Such displacement is not caused as often by cysts as by tumors or large metastatic nodes.

Renal-cell carcinomas not infrequently metastasize or reach palpable size without causing hematuria, because they arise in the cortex of the kidney. However, they do bleed more frequently than cysts. The amount of hematuria in this case was sufficient to cause clots and a red-cell count of 3,280,000. I have not seen a cyst bleed to this extent. The left-flank pain accompanying the hematuria could be caused by bleeding into the mass, bleeding into the pelvis of the kidney or bleeding from the mass into the surrounding tissue. I imagine it was due to bleeding into the mass, for the pain apparently did not persist throughout the period of hematuria, as it might have done if caused by clots passing down the ureter. Palpation of cysts and hypernephromas is often possible. Occasionally a cyst will be decidedly soft and compressible, or a tumor will be nodular. Usually, however, palpation does not aid in deciding between them.

Before ending this discussion, I should like to emphasize that in spite of the information one gains from cystoscopic examination, Papanicolaou stain, pyelograms, perirenal air insufflations, arteriograms and other studies, the nature of many masses of the kidney can be determined only by visualizing the lesion. Unless there are adequate reasons for not operating there is only one course to follow—and that is to explore the kidney.

CLINICAL DIAGNOSIS

Tumor of kidney.

DR. KERR'S DIAGNOSIS

Renal-cell carcinoma.

ANATOMICAL DIAGNOSIS

Hematoma of peripelvic fat with pressure necrosis of surrounding fat and kidney.

PATHOLOGICAL DISCUSSION

Dr. Robert E. Scully: At operation the surgeon encountered a mass deeply occupying the lower hilus and inferior pole of the left kidney. In the belief that this was neoplastic, a nephrectomy was performed. On sectioning, the operative specimen proved to be only clotted blood surrounded by an irregular rim of soft, yellow necrotic tissue. The entire lesion measured 7 cm. in diameter and occupied both peripelvic fat and adjacent renal parenchyma; the pelvis and ureter were displaced medially. Microscopical examination disclosed organizing hemorrhage and necrosis of fat and renal parenchyma. The necrosis appeared by its peripheral localization to be a pressure phenomenon. Numerous sections were taken in an attempt to elucidate the pathogenesis of the hemorrhage. No lesions were found in the arteries except for a rather severe intimal fibrosis and hyalinization. Several veins

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of medium size that lay in the hilus at the outskirts of the lesion showed areas of fibrinoid necrosis, and a few smaller ones contained organizing trombi. However, we regarded these changes as being secondary to the necrosis and not causative lesions.

A Physician: Perirenal hemorrhage has been described in periarteritis nodosa; in view of the vascular lesions you mention, I wonder if the hemorrhage in this case may not have been the earliest manifestation of some generalized vascular disease.

Dr. Scully. I do not believe so. In a follow-up letter received from the patient some four and a half years after operation, she stated: "I am in good health and have not been in bed a day since I left the hospital."

MORE TB BEDS FOR INDIANS

Tuberculosis, responsible for 23 per cent of the Navajo Indian death rate, will be attacked in a special project announced recently by the Bureau of Indian Affairs. The project will include contracting for approximately 400 additional beds at sanatoria off the reservation to supplement the present total of 115 beds available for TB treatment at reservation hospitals.

NEWS ITEMS

DR. KENT THAYER HEADS MARICOPA COUNTY SOCIETY

Officers for 1953 were announced by the Maricopa County Medical Society.

Doctors named were Kent H. Thayer, president; Lloyd Swasey, vice president; Wallace A. Reed, secretary-treasurer; John A. Eisenbeiss, Leslie B. Smith, Carlos C. Craig, E. Henry Running, Joseph Bank, Frank W. Edel, D. W. Melick, Marriner W. Merrill, Preston T. Brown, Howard Lawrence, Audrey G. Urry, and G. Robert Barfoot, board members.

Dr. Donald Polson was chosen president-elect for 1954.

ARIZONA BOYS RANCH

Dr. William Bishop has been elected to take over the presidency of the Arizona Boys Ranch board of directors for the coming year. Dr. Bishop, widely known orthopedic surgeon who has been identified with Phoenix civic affairs since coming here several years ago, has served on the board of Boys Ranch since its inception.

He succeeds Harold Scoville as president. Robert Jaap, vice-president of the First National Bank of Arizona, will be treasurer, and Al Waters continues in his post as executive secretary.

Vice presidents include George Miller, Boy Scout executive in Phoenix; George Babbitt, Flagstaff; Clarence Carpenter, Miami; the Rev. David Sholine of Tucson; and Ray Smucker of Yuma.

Continuing on the executive board are: Jack Barnes, Harry Bonsall, Sr., William Bourdon, Bruce Brockett, Charles A. Carson, Mrs. Ralph Cowan, Leighton Cress, Norman Fain, Eugene Mangum, Mrs. John Neal, Richard O'Hara, William Passey, Gov. Howard Pyle, Harold Scoville, M. H. Starkweather, Hollice Stevenson, Leo Ellsworth.

OBSERVE THE DATES

1953 Annual Meeting

TUCSON (Pioneer Hotel) **ARIZONA**
April 26 through 29, 1953

SUNDAY (April 26th) – Council, House (1st Session) and Blue Cross-Blue Shield Meetings – Golf Tournament – Tucson Country Club

MONDAY Through WEDNESDAY (April 27-29) – Scientific Sessions

TUESDAY (April 28th) – House (2nd Session)

WEDNESDAY (April 29th) – President's Dinner-Dance

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THE AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION

The 31st annual scientific and clinical session of the American Congress of Physical Medicine and Rehabilitation will be held on August 31, September 1, 2, 3 and 4, 1953 inclusive, at the Palmer House, Chicago, Ill.

Scientific and clinical sessions will be given on the days of August 31 and September 1, 2 and 3. All sessions will be open to members of the medical profession in good standing with the American Medical Association.

In addition to the scientific sessions, annual instruction seminars will be held. These lectures will be open to physicians as well as to therapists, who are registered with the American Registry of Physical Therapists or the American Occupational Therapy Association.

Full information may be obtained by writing to the executive offices, American Congress of Physical Medicine and Rehabilitation, 30 North Michigan Avenue, Chicago 2, Illinois.

HILL-BURTON HOSPITAL CONSTRUCTION

Division of Hospital Facilities, FSA, reports that as of December 2, 1952, one new project had been approved for Hill-Burton grants in the State of Arizona, as follows:

Located at Winslow—Winslow Memorial, at a total cost of $199,724 including federal contribution of $99,862, to supply 24 additional beds.

Status of all Hill-Burton hospital construction in Arizona, including the above, is as follows:

Completed and in operation: 7 projects at a total cost of $3,340,501, including federal contribution of $1,132,516, and supplying 246 additional beds.

Under construction: 2 projects at a total cost of $6,086,549, including federal contribution of $1,523,230, and designed to supply 375 additional beds.

Approved, but not yet under construction: 8 projects at a total cost of $1,644,886, including $687,362 federal contribution, and designed to supply 224 additional beds.

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The PRESIDENT'S *Page*

TRUMAN'S COMMISSION ON THE HEALTH NEEDS OF THE NATION

ON DECEMBER 18, 1952, THE PRESIDENT'S COMMISSION ON THE HEALTH NEEDS OF THE NATION RELEASED THE FIRST VOLUME OF ITS REPORT. THE PAST ADMINISTRATION HAS ENDED BUT WE ARE STILL BEING PLAGUED WITH SOME OF ITS OUT-MODED THOUGHTS AND IDEAS.

OUR TRUSTEES OF THE AMERICAN MEDICAL ASSOCIATION HAVE RELEASED A STATEMENT ON THE REPORT OF THIS COMMISSION. IT APPEARED IN THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION ON JANUARY 24, 1953. I STRONGLY URGE ALL OF YOU TO READ THIS REPORT IN ITS ENTIRETY.

NEARLY ALL OF THE COMMENTS CONTAINED IN THE COMMISSION'S REPORT HAVE LONG HAD THE THOUGHTFUL CONSIDERATION OF THE AMERICAN MEDICAL ASSOCIATION AND MANY OTHER ALLIED HEALTH GROUPS. FURTHERMORE, MANY OF THE SOLUTIONS PROPOSED HAVE BEEN THOROUGHLY AIRED IN THE HALLS OF CONGRESS AND REJECTED. THE REPORT AT PRESENT IS DEVOID OF SUPPORTABLE FACTUAL MATERIAL. THE BASIC PHILOSOPHY UNDERLYING IT IS QUITE EVIDENT; THE ARGUMENT IS THAT HEALTH IS CONDITIONED BY FOOD, HOUSING AND EDUCATION, SO THAT THE CONTROL OF THESE FACTORS, AS WELL AS HEALTH MEASURES PER SE, SHOULD COME UNDER THE DIRECTION OF AN "ALL WISE" FEDERAL GOVERNMENT. WITHOUT NAMING IT THE COMMISSION HAS DESCRIBED A "WELFARE STATE", IT MAY BE JUST AS WELL TO CALL IT BY ITS TRUE NAME, THE "SOCIALISTIC STATE".

THE COMMISSION HAS LITTLE TO OFFER THAT IS NEW. THE ISSUE PROPOSED FOR THE SOLUTION OF NEARLY EVERY PROBLEM IS ADDITIONAL FEDERAL FUNDS. ASIDE FROM THE QUESTION AS TO HOW THESE FUNDS ARE TO BE RAISED, IN THE BACKGROUND LURKS THE SHADOW OF FEDERAL CONTROL IN ALL THESE ENDEAVORS. THE CONTROL MAY COME DIRECTLY OR BY ESTABLISHED STANDARDS TO WHICH ALL STATES MUST CONFORM. THESE STANDARDS WILL NOT BE WRITTEN INTO LAW BUT WILL BE ESTABLISHED BY ADMINISTRATIVE REGULATIONS. IF THE PATTERN, LAID DOWN IN THE FORM OF BILLS, IS FOLLOWED THE ADMINISTRATIVE AGENCY WILL AUTHORIZE TO SET UP A PLAN OF ITS OWN IN ANY STATE THAT DOES NOT CONFORM TO FEDERAL STANDARDS.

ONE OF THE MOST PECULIAR ASPECTS OF THE COMMISSION'S REPORT IS THAT IT IS BEING PRESENTED IN THE REVERSE OF ITS PROPER ORDER. THE SCIENTIFIC AND LOGICAL APPROACH WOULD BE THE PRESENTATION OF FACTUAL MATERIAL AND ANALYSES OF THE DATA PRESENTED, COMPARISON OF THIS DATA WITH OTHER MATERIAL OF A LIKE NATURE, AND THE PRESENTATION OF CONCLUSIONS ON THE BASIS OF FACTS, AND FINALLY RECOMMENDATIONS AS TO THE ACTION. THE REVERSE HAS BEEN THE PROCEDURE IN THIS CASE.

OF COURSE IT IS NOT POSSIBLE AT THE PRESENT TIME TO ANALYZE OR EVEN UNDERSTAND THE REPORT UNTIL THE BALANCE OF VOLUMNS CONTAINED IN THIS REPORT ARE RELEASED. HOWEVER, AT THE PRESENT TIME IT APPEARS THAT THE HEALTH COMMISSION HAS SHOWN ABSOLUTELY NOTHING NEW, THAT WHICH IT HAS SHOWN CERTAINLY SMACKS OF THE SOCIALISTIC STATE.

THOMAS H. BATE, M.D., PRESIDENT
ARIZONA STATE MEDICAL ASSOCIATION

Editorial

ARIZONA MEDICINE

Journal of

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VOL. 10 FEBRUARY, 1953 NO. 2

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CONTRIBUTORS

The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.

2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. (See MEDICAL WRITING by Morris Fishbein.)

3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.

4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.

5. Submit manuscript typewritten and double-spaced.

6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

The Editor is always ready, willing, and happy to help in any way possible.

EDITORIAL
THE SURGEONS RESPONSIBILITY

From time to time conflicts arise between physicians and patients many of which may be due to failure of the physician to inform patients adequately. Recently such a conflict arose in an emergency appendicitis operation over the employment by a physician of an anesthetist for a minor without the patient's legal guardian's knowledge.

It is true that most patients realize that anesthesia is necessary in the performance of surgical procedure. It is well, however, to always acquaint patients that an anesthetist is to be utilized, as some people apparently do not know that a general anesthetic may be necessary for certain operative procedures. It is only fair to our fine group of anesthetists that we do this not only so that they will not encounter difficulties in obtaining re-imbursement for their valuable services, but also to put them in a safe position of legal employment by the patient or relatives of the patient.

A surgeon's responsibility may occasionally be strained by the necessity of performance of emergency procedure on a minor when legal permission cannot be immediately obtained from those responsible for granting permission. In such instances the physician should not hesitate to do what is clearly necessary as an emergency, but in the absence of correct legal permission, a

physician *must* have adequate consultation by a colleague to justify his position. This should be in writing on the hospital record. The courts have always held that clear-cut emergencies can be treated properly pending obtaining permission, but it is the physicians responsibility to *prove* the clear-cut need, in the absence of legal authority. This consultation in writing is mandatory in every instance.

Misunderstandings will rarely occur if the physician exercises reasonable care and acquaints patients or guardians of the need for an anesthetist, or, in the case of an emergency too dire to await legal permission to proceed, of the employment of consultation of other qualified physicians who agreed that operative treatment had to be employed on a minor or unconscious adult before permission could be obtained by ordinary legal means.

MEETING NOTICE AMERICAN GOITER ASSOCIATION

The American Goiter Association will hold its 1953 meeting at the Drake Hotel, Chicago, Illinois May 7, 8 and 9, 1953.

The program for the three day meeting will consist of papers and discussions dealing with goiter and other diseases of the thyroid gland.

STANFORD PRESENTS POST-GRADUATE COURSES

Stanford University School of Medicine will present the following Postgraduate Courses in June 1953: Cardiology, June 15-19; General Medicine, June 15-19; Surgery and Treatment of Fractures and Associated Trauma, June 24, 25, and 26; and General Surgery, June 22-26. The Stanford faculty will be instructors in these courses and the fee for each course is $75.00. Each course will be given all day.

Programs will be available in March and inquiries may be addressed to the Office of the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

The Arizona Medical Association, Inc. Membership Report

Membership of the State Association on January 1, 1953, totalled 681, representing a net gain of 45 since January 1, 1952. During the past year 70 physicians were admitted as new members; 15 moved from the state; 2 were dropped from membership; 5 were deceased.

Included in the 681 membership total are 624 Active members, 31 Affiliate, 16 Affiliate-Military, and 10 Associate members.

AMERICAN COLLEGE OF PHYSICIANS

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TOPICS OF *Current Medical* INTEREST

RX, DX, AND DRS.

By GUILLERMO OSLER, M. D.

The theorists are waiting with assumed unconcern for the more practical results from CHEMOTHERAPY OF TUBERCULOSIS. . . . They can prove, by analogy and mathematics, that resistance of tubercle bacilli to several drugs is lessened when the drugs are given simultaneously. . . . Theory and practice worked out well with PAS and streptomycin, but isoniazid has been used with the other drugs for so short a time that one can't yet be sure. . . . It is the mode at present to use all the three until proof is available. The therapeutic effect, at least, will be better, and it MAY be safer.

The status of NURSING HOMES in California has been summarized by their Bureau of Hospitals. . . . About 9,000 beds are available in 450 Homes. Whether this is few or many for such a large state depends on your viewpoint, but an average occupancy rate of 83 per cent suggests that a considerable need exists. . . . The type of patients was diverse, as was the type of care, but ambulatory patients were given the assurance of protection and ill patients were given quite a range of medical-nursing procedures.

The monthly Alvarez item, lifted from his journal 'Modern Medicine', stresses the lack of excess hazard in OPERATING ON PATIENTS WITH A HEALED MYOCARDIAL INFARCT. . . . Brumm and Willins reported in 1939 that only about 4 percent of 257 patients with angina pectoris died of cardiac complication after surgery. . . . Hannigan & colleagues recently reviewed the situation in the Amer. Jour. Med. Sciences and found that the rate in coronaries was only 5.2 per cent compared with 3.4 per cent in a similar age group of normals. . . . Penthothal anaesthesia seems inadvisable, since it is more often accompanied by cardiac and respiratory complications. A fast and deft operation is least hazardous.

Doshay and Associates of Columbia University have described a drug combination for PARKINSONISM in NEUROLOGY. . . . The drug is called MK-02, and is made up of an antihistaminic radical (of Benadryl) and a parasympatholytic radical (of atropine). . . . Doshay may be remembered for work in other fields (tularemia, etc.). . . . The series is not large, but the side reactions are scanty (dry mouth 17%), and the muscular rigidity, spasm, contracture, tremor, and salivation were often relieved.

A Tucson trio is slightly ahead of the Arizona Medical Ass'n. in an attempt to obtain A TRAINED MEDICAL EXAMINER for Pima County. . . . Two Justices of the Peace have joined health Officer Dr. Lewis Howard in pleading with the county board of supervisors to appoint a trained M.D. pathologist to investigate deaths which occur without medical care. . . . Dr. Salsbury has pointed to the 105 persons in Pima County who were buried in the past year without a known cause of death. . . . The state medical association is preparing legislation which they hope may be enacted at the state level.

A question of precedence is still moot in the use of certain antibiotics. Does A FUNGUS INFECTION develop after one takes aureomycin, teramycin, et al., due to the absence of other organisms, or because of fertile terrain? . . . Are we blaming fungi when many mucous membrance lesions are due only to DRUG REACTION? . . . Probably all these factors are operative at times, and sometimes a harmless flora will become somewhat pathogenic. . . . It should also be remembered that 'all which is Candida is not moniliasis'. They may just happen to be there, and are not real 'superinfections'. . . . Dr. Perrin Long says that penicillin toxicity is usually allergic, but that Polymyxin B and Bacitracin are polypeptides and rarely if ever cause ALLERGIC response.

ISONIAZID has secretly been used in treatment of tuberculosis for about 18 months, and publicly for about nine. It is amazing therefore to find even early reports of success in an even more sluggish disease than tuberculosis—LEPROSY. . . . Latapi and Rubio of Mexico reported before the American Society of Tropical Medicine that 13 of 14 cases with nodular disease showed a substantial reduction of lesions, with 200 to 300 mg., per day over a period of 9 months.

LOS ANGELES MEDICAL AFFAIRS used to be regarded with raised eyebrows by many physicians east of the Sierra Madres, and with laughter east of the Mississippi. There was considerable reason for it, with scanty teaching facilities, ineffective medical groups, and very vocal quacks and non-medical 'healers'. . . . In the past dozen years the level of practice has been raised and the level of the eyebrows lowered. The various medical groups have originated several treatment methods; the medical societies and hospitals have very good programs; a new medical school has increased the chance and competition for staff work; and surprising ideas are given a hearing. . . . E. G., — The

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Good Samaritan Hospital and U.S.C. have raided Philadelphia (for Dr. Hurley Motley) as well as the pockets of quite a few wealthy and dyspneic patients, to found a research unit for cardiorespiratory physiology. If this unit seems not unusual, select ten of the largest cities in the U. S. and find out how many are set up for such clinical studies. (We asked about it last June in Chicago, and no one even knew that such a service WASN'T available). . . . In another radical but logical move the Cal. Med. Ass'n. has announced a full-scale investigation of a variety of unproved cancer treatments. Claims for drugs and serums will be investigated, labelled, and the proponents disciplined if they are intransigeant. . . . The Cal. group is also a sponsor of the move to 'regenerate' and assimilate the osteopaths, a move now being considered on a national plane. Exclamation point, question mark!

Dr. Edmund Keeney of San Diego describes a little-used method of TESTING highly allergic children, BY PROXY. . . . Extensive skin-tests can be difficult, but also hazardous. A passive transfer of antibodies (in blood serum) is first effected from child to a healthy adult volunteer. The adult is then sensitive for a few weeks, and will react as the child would to skin-tests.

Home state boys again made good in national journal! Or, five Tucson physicians crash the J.A.M.A. with an article on the use of PHENYLBUTAZONE IN ARTHRITIS. . . . Next to appearing in ARIZONA MEDICINE, such publication is the high honor. Drs. Stephens, Yeoman, Holbrook, Hill, and Goodin are to be congratulated. If the drug is really good, it would be fine to have an article here. . . . The salutary effects were fairly frequent, but toxic effects were also rather common. . . . In any case, Hooray for clinical research in Arizona!

If this column needed a paragraph with A JOKE in it, we might lift the pun which a trade journal used to introduce a news note. . . . The news: a Minnesota doctor was indicted on 229 separate counts for peddling narcotics, and faced prison terms totalling 2,030 years. The introduction: Long Time No Fee!

One must update the anti-malarial news with a paragraph every few months. The present item sounds like real progress. . . . The Wellcome Research Laboratories, thru Dr. George Hitchings, is said to have a great new drug 'daraprin'. It is 12 times as powerful as the top-notch chloroquine which is now in use as a preventive in Korea. . . . Daraprin is so destructive of the malarial parasite in the blood that the effective dose is less than half a grain per week. It is said to be tasteless, inexpensive, and quite safe. General use in the whole population of an infested country could lead to a malaria-free race of mosquitoes, and further safety of the people.

Until we hear confirmation, the new "Q-Test" for diagnosis of pregnancy is only worth a shortened paragraph. . . . Claims,—Advertising in J.A.M.A. No lab specimen required. Can be done in office. Time required is about an hour. Accuracy is 96 to 98%. Cost is 60 to 80% less than other methods. . . . Mas des pues.

It would be hard to estimate the percentage of physicians who go beyond the surface relationship between CARDIAC FAILURE AND EDEMA. . . . Most of us could think up the trio of vascular pressure, blood proteins, and electrolytes. . . . Only a few would know the theory that sodium retention in heart failure is said to be due to hepatic congestion, with the failure of the liver to inactivate adrenal corticoids, which act on the kidneys to retain sodium. . . . The cordicoid hormone accelerates renal tubular reabsorption of sodium, with a secretion of P.P. antidiuretic hormone, with a resultant water retention. . . . Etc., etc., since this explanation may eventually prove too simple.

Dr. Edgar Allen of the Mayo Clinic has summarized the current status of therapy for HYPERTENSION in the Clinic 'Proceedings', and in 'Circulation'. A few general conclusions are of interest. . . . Medical methods are effective in many cases. Drugs are becoming more helpful, but are still far from ideal. Medical treatment should be tried at first, but only briefly if ineffective. If there are no major contraindications, the patient should then have sympathectomy while still in his "Golden period", when success is most probable. . . . There is no way of knowing which cases will be helped. Medical management can be used after surgery no matter what its success has been.

We recently treated a large area of herpes on a man's forehead with cortisone, and the result was dramatic and cosmetically satisfactory. . . . In writing down the report, a Walter Winchellism was invented, and it seems bad enough to mention here. The herpes was a SKINFLAMMATION, and the cortisone was in ideal THERABEAUTIC. . . . (What ever happened to W. W.?)

NOTICE

ALL CONTRIBUTORS OF ARIZONA MEDICINE SHOULD HAVE THEIR MATERIAL IN THE JOURNAL OFFICE NOT LATER THAN THE 15th OF THE MONTH PRIOR TO PUBLICATION IN ORDER TO HAVE ARIZONA MEDICINE REACH ITS READERS ON OR BEFORE THE 15th OF THE MONTH.

Material arriving after that date will be published the following month.

NOT FOR PROFIT

THE HOSPITAL BENEFIT Bulletin

Special Published Bi-Monthly by the Hospital Benefit Association, First Street at Willetta, Phoenix February, 1953

Question QUIZ
Do you know the answers?

Q. Does the HBA Surgical Plan Pay for wound repair, X-rays and treatment of fractures in the Doctor's office?

A. Yes—when as a result of an accident and if within 24 hours of the accident.

Q. How long does it take for doctors to receive their fees?

A. When information is complete and the patient's membership is in order, all bills are paid within five days.

Q. Can doctors help speed up HBA payment for their fees?

A. Yes—by promptly billing the Association and by giving necessary data in standard medical nomenclature.

Q. How frequently does the HBA pay doctors' bills?

A. Every working day of every month.

Q. May an HBA member go to the doctor of his choice?

A. Yes. HBA members may go to any physician (M.D.) anywhere in the world.

"Have a carrot, it might improve your eyesight."

HBA Pays ALL Fees Promptly; Cuts Paper Work For Doctors

The Hospital Benefit Association likes to pay doctors' fees as quickly as possible—with a minimum amount of paper work for the doctor. The Association's simplified bill form which doctors can quickly and easily fill out was adopted for this reason.

This easy-to-use form lists all needed data. This information includes the patient's name, HBA membership number, the Diagnosis and Surgical Procedure and the surgeon's fee. Past experience shows that additional data is needed in only 3% to 4% of the total claims handled.

Additional information is requested only when the Association needs facts from the physician in order to reach an equitable decision regarding the coverage to which a member is entitled. This might be occasioned by a new membership, or by a membership issued with the written understanding that a pre-existing condition would not be covered.

Doctors Can Speed Payments

Doctors themselves can help speed up payments for their services by promptly sending the Association their bills together with the information needed to process claims.

Payments are made every working day of every month so that doctors won't have to wait for their fees. And no bill remains in our office more than five days if statements are complete and the patient's membership is in order.

The Hospital Benefit Association automatically sends a statement form to the patient to be given to the doctor. However, many doctors prefer to keep a supply on hand. We will be glad to send some to you. Write us at either the Home Office, First Street at Willetta, Phoenix, or 706 Valley National Building, Tucson.

Accident Treatment In Doctor's Office Covered by HBA

The Hospital Benefit Association covers treatment in a doctor's office under certain conditions.

The Association pays for accidental injuries including treatment of fractures, dislocations and wound repair in the home or the doctor's office if treated within 24 hours of the accident. It also pays for X-ray examination for fractures and dislocations in the doctor's office.

Xmas Program Salutes All Arizona Hospitals

To help tell the story of the origin and development of modern hospitals and publicize some of the many problems they face, the Hospital Benefit Association sponsored a half-hour Christmas radio program over nine stations of the Arizona Broadcasting System.

The broadcast was presented for two reasons: (1) to help better public relations for the hospitals; and (2) to show the Association's appreciation to the medical profession for its cooperation with HBA members.

Called "A Christmas Salute to Your Hospital," the program highlighted the accomplishments of Arizona hospitals, and pointed out the problems hospitals face as a result of Arizona's rapid population growth.

The entire program was produced with the complete cooperation and approval of the Arizona Hospitals Association. It was presented as a public service feature of the Hospital Benefit Association.

XUM

Arizona Pharmaceutical Page

What the Doctor Should Know About Prescription Pricing or Facts About Prescription Pricing

By C. W. Dudding, Chairman, Executive Committee, Arizona Pharmaceutical Ass'n.

Why should a physician know how the average pharmacist prices prescriptions? Generally speaking he should understand the methods commonly used by pharmacists, because it is in the interest of their patients. This is necessarily true because you are interested both from the health and the economic points-of-view. Objectively, your first consideration is the treatment of the patient. Subjectively, the second consideration is the economic ability of the patient to fulfill the objective desired. The two, of necessity, go hand-in-hand in an economy such as we have here in the United States.

Now this may not be a good situation but it does have a direct bearing upon the treatment you utilize for the patient's benefit. In this respect, we are generally agreed that a workable plan of prepaid health insurance, under a voluntary system, whereby the individual will retail his freedom of choice, would be of positive value so far as the general health of the individual is concerned.

Regarding prepaid health insurance, we as pharmacists believe that the federal government's role in the formulation of desirable systems or plans to achieve this goal should be neutral. The complete control and administration must not be delegated to the federal government! We state this emphatically because we, the same as you, will have no part in a paternalistic form of government.

The pharmacists of Arizona commend the physicians of Arizona for the militant stand they have taken in the prevention of this typically American ideal!

We have digressed somewhat from the subject but we believe that you should know what our convictions are regarding the medical schemes proposed by certain elements in Washington. Or should we say, formerly in Washington.

Now then, back to how the average pharmacist in Arizona prices prescriptions. In our everyday practice of pricing prescriptions most of us use a pricing schedule. These schedules have evolved over the past many years and have weathered the economic storms proving their reliability as to fairness to the public and to the pharmacy.

Here's how the system works; the patient brings the prescription in, hands it to the pharmacist for compounding. After filling the prescription, the pharmacist prices it according to the printed schedule price. This is the amount the consumer pays for the medication.

You have probably observed these pricing schedules in various pharmacies and have wondered how they were used. Briefly described, they are in the form of a tabular index. Across the top horizontally, the divisions are in quantities most usually prescribed by the physician, i.e., 1, 2, 3, 4, up through 16 ounces for liquids. The same applies for tablets, capsules and ointments. Down the left side, vertically, the cost prices are listed. Usually for tablets the cost per 100; for ointments the cost per ounce and liquids the cost per pint.

Now you may visualize how quickly we arrive at prescription prices. At the point where the cost line intersects with the quantity line there is a printed amount. This amount is the price value of the prescription and the one generally used in making the price determination. Other factors incident thereto may, or may not, be added. This will account for the slight fluctuation in prices among various pharmacies.

For example, let us take a prescription calling for "Tabs. Phenobarb, No. 100, grains 1½." If the cost were .50c per 100, then the price would be $1.60. If you had prescribed 50, the price would be $1.15; 24/.95; 12/.85. For example number 2, let us take a prescription calling for Elixir Nembutal. If the cost per pint were $2.90, then the selling price would be: 16 oz./$5.50; 8 oz./$3.10; 4 oz./$1.95.

For example 3, let us take the Mycin group. If the cost per 100 were $30.60, then the price to your patient would be: 100 caps./$50.95; 50 caps./$25.85; 24 caps./$12.80 and 12 caps. $6.80.

From the preceding you realize that an honest effort has been made by the schedule designers

to mathematically place the price value in a bracket where everyone gets an equal break price-wise. That is to say literally, that inexpensive prescriptions are scaled upward and that costly ones are scaled downward in order to arrive at a favorable balance on behalf of the average consumer, from an economical point of view.

Now here's where you may be of valuable assistance to the patient in sofar as the individual's ability to pay is concerned. You usually know more concerning the patient's financial condition than we do, therefore, whenever feasible and practical, we suggest that you write prescriptions in units of 100's, pounds, pints or in the larger amounts or multiples. We know that the amount prescribed for each individual must necessarily be tailored to the individual's requirements. We also know that it may not be the prudent thing to prescribe in quantities in the upper brackets, when the patient needs only small amounts. Most of us appreciate the fact that many physicians tell their patients what a prescription will cost, especially higher priced prescriptions. Naturally, we would prefer that you state it as being around such & such an amount, i.e.: between $5.00 and $6.00. If a specific amount is stated, it places the pharmacist sometimes in an embarrassing position. Usually the patient does not quote the amount stated by the physician until after the pharmacist states his price. Now you can understand this particular situation.

This points up again the desirability of the physician knowing how prescriptions are priced; also knowing the prevailing prices for most of the commonly used medications, particularly those from $5.00 upward. This also helps us with our relations with your patients. You might call it a "conditioning process."

You may be assured that we are vitally interested in doing everything reasonably possible to maintain the cost of medication to the patient at a minimum level. This is as it should be; a joint responsibility and obligation upon medicine as well as upon pharmacy.

In conclusion, we extend an open invitation for you to come in and go over our pricing schedules. Discuss with us the points which may not be too clear at the present time relative to prescription pricing.

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ANNIVERSARY

An anniversary of more than passing note was that of Arizona Blue Shield as it formally celebrated its fifth year of operation in the state. The event was staged December 6th in Phoenix. Well-attended, there were representatives from business and the medical and allied professions present. All told over fifty guests gathered at Green Gables for the dinner meeting.

Dr. David C. James, Blue Shield president, presided over the evening's activities. Included on the varied and interesting agenda were: Sam Barham, Blue Shield Commissioner for District IX (home base: Topeka, Kansas), who presented Dr. James with a scroll from the Blue Shield Commission, Chicago, commemorating the anniversary; a presentation of achievement awards to Drs. E. Payne Palmer, Sr. and Carlos C. Craig, past presidents of Arizona Blue Shield, and to Dr. James, the incumbent. The presentations were made by L. Donald Lau, Executive Director of both Blue Cross and Blue Shield.

Guest speaker for the occasion was Dr. L. Howard Schriver, President of the Blue Shield Commission, Chicago (his home base: Cincinnati, O.), who brought a pertinent message on the future of Blue Shield and the necessity of its close working relationship with Blue Cross.

Sidelight of Commemoration Activities: Little five year old Margaret Hruby, daughter of the Stanley C. Hrubys, Phoenix, was presented with a doll by Dr. Paul Armour in behalf of Blue Shield. The reason: Margaret was the first baby born under Blue Shield in Arizona. Dr. Armour is her doctor.

FIGURES .....

As of September 30, 1952 (first three-quarters of the year) there were 23,683,940 Blue Shield members, according to figures released by the Blue Shield Commission, Chicago. Percentage-wise this represents 15.50 of the total populations of Canada, Hawaii, Puerto Rico and the United States.

17,772 people are joining Blue Shield every working day of the year, a pretty lively statistic.

COMMISSIONER .....

L. Donald Lau, who has served two terms as General Chairman of District IX for Blue Cross and Blue Shield, will assume new duties when his term expires in April. At that time he will become Blue Shield Commissioner for the District.

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Mrs. Brick P. Storts
Chairman, State Organization
Tucson, Arizona

Woman's AUXILIARY

CIVIL DEFENSE NEWS

The Health Service of the Civil Defense Agency in the State of Arizona has been organized with Dr. Joseph Greer heading the State Health and Medical Service. He has the chief responsibility for supervision, actual services, and professional and technical personnel in time of disaster. This local organization must provide both for reserves and for the automatic replacement of command in the event of top administrative officials being killed or disabled during an enemy attack. Doctor Greer also must have a training program for volunteers in all administrative phases of the Health Program. He has built his organization around the State Health organization in each individual county and each county has its head for the Civil Defense Health Service Program. In Maricopa County Dr. Ben P. Frissell and Dr. R. W. Hussong are in charge of the Program; in Pima County Dr. R. N. Howard and Dr. H. W. Thompson are in charge.

There has been established over the State a Hospital Plan that is complete and in operation, and a Doctor's Disaster Control Plan that will use all of the professional manpower available, including pharmacists, dentists, etc. Since health service training is an essential part of the overall civil defense program, facilities have been set up to include the following courses: Medical Aspects of Atomic Warfare, Defense Against Biological Warfare, Defense Against Chemical Warfare, Treatment of Burns, General Treatment of Casualties, Organization of First Aid, Rescue, Ambulance, and Emergency Hospital Service, General Administrative and Organization Problems.

Nurses Aides and Home Nurses are being trained by the Red Cross. Most of the permanent and auxiliary staffs of hospitals will require training if the hospitals are to function effectively in time of disaster. Existing hospitals will cooperate in training volunteers.

Radiological monitors have been trained from non-medical persons—science teachers wherever possible to recruit them. Plans are also in effect for training sanitation personnel to supplement the peacetime staff and to provide for such emergency services as mass feeding centers.

Training of technician aides in the identification of agents used in biological warfare involves special culture and related techniques which are not ordinarily a part of local laboratory routine. Veterinary service of the State has been solicited and they are active in participating in this work which is under the supervision of Dr. Hight.

At present there are eight complete first aid teams, organized and physically set up, ready to go into action in Maricopa County and the City of Phoenix. These mobile first aid teams include doctors, nurses, dentists, etc., and are complete, even down to litter bearers. These teams are assigned to strategic positions within the city and county where they would be able to set up and go into operation at a few minutes notice. Routes of travel have been planned so as to pick up these people at the most convenient points and alternate collecting points and routes have been established. Adequate communications by radio and messenger have been arranged with the civil defense communications center. Mutual aid area units have been established and everyone has been told to completely familiarize themselves with the plan.

Pima County is organizing along the same lines. They have detailed plans adaptable to any situation for the mobilization of vehicles, first aid personnel and first aid supplies.

The Hospital Plan which has been put into effect consists of a complete survey of each hospital—it's beds, personnel, equipment, supplies, etc., and an outline of the functions of the hospitals in the event of a disaster.

Communication must be provided between the hospitals and the local civil defense organization. The hospitals will be responsible for providing the necessary staff for the business office, the procurement section and the communications section. Emergency food service would be provided for casualties and hospital personnel; special diets, pastry, salads, and the normal tray set-up would be discontinued. Each hospital is responsible for developing a Preparedness Plan and for periodically having practice sessions for the regular hospital staff and volunteers.

XUM

Plans have been drawn up for using non-hospital buildings as improvised hospitals since existing local hospitals cannot be expected to care for all surviving casualties of a major civilian wartime disaster. Due to the severe limitations on the availability of hospital furnishings and equipment, improvised arrangements will be planned in advance and the nearby stores and homes will be canvassed to determine the availability of substitute equipment.

These plans are set up to cope with a war-caused emergency but could cope equally as well with any disaster which might happen at any time.

What the Auxiliary can do for Civil Defense:

1. *Red Cross First Aid Course*—Learn how to save lives in your own family. Take a course in first aid and home nursing. Fill in a Civil Defense record sheet in order that your chairman will know the volunteer jobs for which you are trained.

2. *A home survey of medical supplies*—Do you have an adequate first aid kit? Does your neighbor have one? Is every member of the family familiar with it's contents, the use of it's contents, and it's location?

3. *Home Warden Service*—Have you learned home fire protection methods? Have you provided for an emergency feeding program in your home?

4. *Nurse recruitment*—Members of other local organizations should try to interest their club members in a nurse's loan fund.

Mrs. Harry A. Cumming
Arizona Medical Auxiliary
Chairman, Civil Defense
Phoenix, Arizona

Grateful acknowledgement is made to Colonel Q. C. Harvey and the Arizona Civil Defense Agency for their kind assistance.

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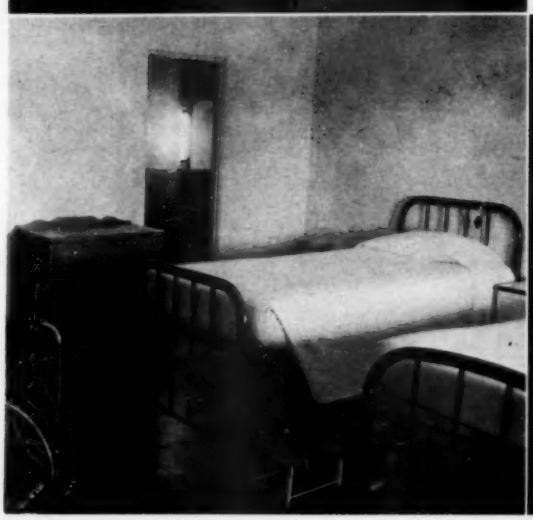

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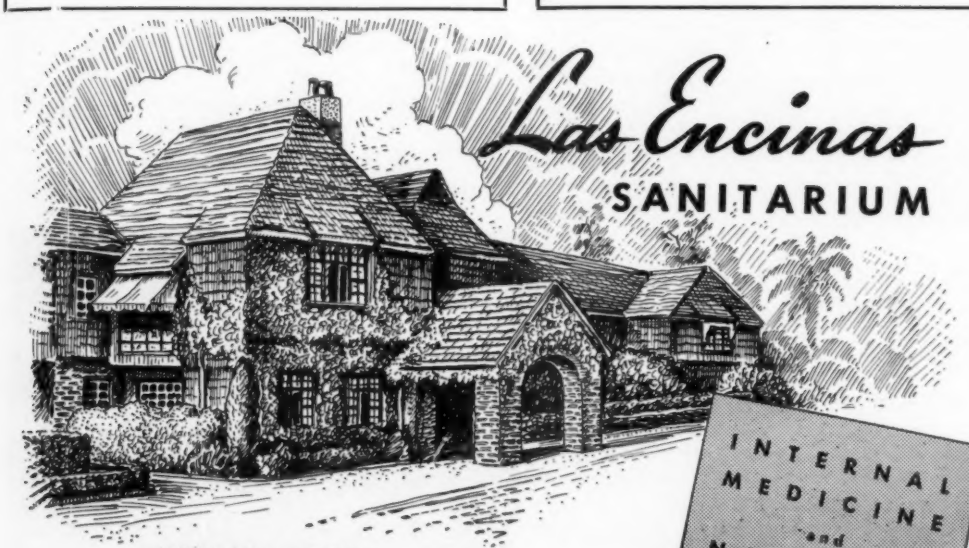

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